
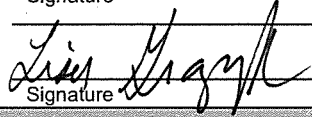
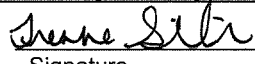


SITE HEALTH AND SAFETY PLAN (HASP)

Office: Chicago, IL
Site Name: M & H Zinc Fund Lead RV
Client: U.S. EPA
Work Location: 1375 9th Street, LaSalle, IL
WO#: 20405.012.001.0729.00

This page is NOT a locked form and it to be used for electronic signatures only. Please be certain to complete the information necessary in the first two (2) blocks on the following page if you use this area. All information may be entered electronically but you cannot tab through the table. Double check boxes and follow prompt to show checkmark. Then paste your signature (from a pdf file) in the signature box.

SITE HEALTH AND SAFETY PLAN (HASP)			
Review and Approval Documentation:			
Reviewed by:	Tonya Balla		Date: 8/24/09
	Name (Print)	Signature	
Other			Date: _____
	Name (Print)	Signature	
Approved by:	Lisa Graczyk		Date: 8-24-09
Project Manager	Name (Print)	Signature	
Hazard Assessment and Equipment Selection:			
In accordance with WESTON's Personal Protective Equipment Program and 29 CFR 1910.132, at the site prior to personnel beginning work, the SHSC and/or the Site Manager have evaluated conditions and verified that the personal protective equipment selection outlined within this HASP is appropriate for the hazards known or expected to exist. (Refer to Safety Officer Manual Section 2, Personal Protection Program, for guidance.)			
<input checked="" type="checkbox"/> FSO	Trenna Seilheimer		Date: 8/27/09
	Name	Signature	
<input type="checkbox"/> Site Manager			Date: _____
	Name	Signature	
<input type="checkbox"/> Environmental Compliance Officer			Date: _____
	Name	Signature	
<input type="checkbox"/> Dangerous Goods Shipping Coordinator			Date: _____
	Name	Signature	
Project start date: August 26, 2009	This site HASP must be reissued/reapproved for any activities conducted after: Date: 12/31/09	Amendment date(s)	By:
End date: October 2, 2009 (estimated)		1.	
		2.	
		3.	
		4.	
		5.	

SITE HEALTH AND SAFETY PLAN (HASP)

Prepared by: Lisa Graczyk **W.O. Number:** 20405.012.001.0729.00 **Date:** 8/24/09

Project Identification

Office: Chicago
 Site Name: M&H Zinc Fund Lead RV
 Client: U.S. EPA

Site History: The entire M & H Zinc site is 160 acres in size and includes several inactive buildings from a former zinc smelting operation (including the Rolling Mill building) and the active Carus Chemical Company.

On August 26, 2008, the START Team contractor, STN Environmental, Joint Venture, conducted a site assessment of a small lab building and the grounds surrounding the Rolling Mill building. The assessment revealed that the lab building had been cleared of all chemicals and that the open yard area east and northeast of the Rolling Mills building is littered with some asbestos and that some piping on the outside of the Rolling Mills building (east side) contains asbestos wrapping.

On August 26, 2009, up to three WESTON START personnel will perform a walkthrough of the site with the U.S. EPA and ERRS to prepare for the upcoming removal action. WESTON is bringing an IL-licensed asbestos inspector to inspect the laboratory building to determine if the laboratory building contains asbestos.

On September 8, 2009, U.S. EPA will begin a removal action at the site to 1) remove asbestos from the yard area and piping outside the Rolling Mills building and 2) demolish the small laboratory building. WESTON START is to provide oversight of this removal activities.

Work Location Address: 1375 9th Street, LaSalle, IL

Scope of Work: This HASP is being prepared for both a site walkthrough which may or may not include asbestos sampling and for the removal oversight.

The site walkthrough will include a walkthrough of small laboratory building (estimated to be half the size of a standard office trailer) and yard area of Rolling Mills building. In addition, an asbestos inspection of small laboratory building will be performed. If small lab building contains suspect asbestos, samples will be collected.

The removal oversight will include documentation of removal activities (written and photographic), maintenance of OSC report files, and perimeter air sampling.

☐ Site visit only; site HASP not necessary. List personnel here and sign off below:

Regulatory Status:

Site regulatory status:

CERCLA/SARA **RCRA** **Other Federal Agency**

☒ U.S. EPA ☐ U.S. EPA ☐ DOE
☐ State ☐ State ☐ USACE
☐ NPL Site **NRC** ☐ Air Force
☒ OSHA ☐ 10 CFR 20 ☐ _____

Hazard Communication (Req'd See Attachment D)

☒ 1910 ☐ 1926 ☐ State

Safety Officer Manual (Required to be On-Site)

Based on the Hazard Assessment and Regulatory Status, determine the Standard HASP(s) applicable to this project. Indicate below which Standard HASP will be used and append the appropriate pages of this form along with the Standard Plan.

☐ Stack Test ☐ _____
☐ Air Emissions ☐ _____
☐ Asbestos ☐ _____
☐ Industrial Hygiene ☐ _____
☐ _____ ☐ _____


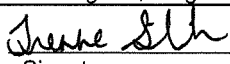
Review and Approval Documentation:

Reviewed by:
 SO/DSM/CHS

Tonya Balla
 Name (Print)

Signature

Date: 8/24/09

Other	Name (Print) _____	Signature _____	Date: _____
Approved by: Project Manager	Lisa Graczyk Name (Print)	 Signature	Date: 8/24/09
Hazard Assessment and Equipment Selection:			
In accordance with WESTON's Personal Protective Equipment Program and 29 CFR 1910.132, at the site prior to personnel beginning work, the SHSC and/or the Site Manager have evaluated conditions and verified that the personal protective equipment selection outlined within this HASP is appropriate for the hazards known or expected to exist. (Refer to Safety Officer Manual Section 2, Personal Protection Program, for guidance.)			
<input checked="" type="checkbox"/> FSO	Trenna Seilheimer Name	 Signature	Date: 8/27/09
<input type="checkbox"/> Site Manager	_____	_____	Date: _____
<input type="checkbox"/> Environmental Compliance Officer	_____	_____	Date: _____
<input type="checkbox"/> Dangerous Goods Shipping Coordinator	_____	_____	Date: _____
Project start date: 8/26/09 End date: 10/2/09	This site HASP must be reissued/reapproved for any activities conducted after: Date: 12/31/09		Amendment date(s) 1. 2. 3. 4. 5. By:

Vehicle Use Assessment and Selection	
Driving is one of the most hazardous and frequent activities for WESTON Employees. The most appropriate type vehicle(s) authorized for use on this project is/are:	
1. Personal or rental vehicle (mid-size or SUV) 2. 3. 4.	
The following Project Team Member's qualifications and experience in driving these types of vehicles was evaluated and found to be acceptable (indicate vehicle type(s) number next to employee name).	
1. Lisa Graczyk 2. David Wojcik 3. Trenna Seilheimer 4. 5. 6. 7. 8. 9. 10.	
The project site was evaluated and a Traffic Control Plan <input type="checkbox"/> is required <input checked="" type="checkbox"/> is not required.	
If required, the Traffic Control Plan can be found in Attachment H.	

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ATTACHMENTS

ATTACHMENT A	Chemical Contaminants Data Sheets
ATTACHMENT B	Material Safety Data Sheets
ATTACHMENT C	Safety Procedures/Field Operating Procedures (FLD Ops)
ATTACHMENT D	Hazard Communication Program
ATTACHMENT E	Air Sampling Data Sheets
ATTACHMENT F	Incident Reporting
ATTACHMENT G	AHA Checklist and Environmental Compliance
ATTACHMENT H	Traffic Control Plan
ATTACHMENT I	Audit Forms
ATTACHMENT J	Environmental Health & Safety Inspection Checklist
ATTACHMENT K	Environmental Protection and Sustainability Program Impact Checklist

1. PERSONNEL ON SITE INFORMATION

1.1 WESTON REPRESENTATIVES

Organization/Branch	Name/Title	Address	Telephone
Dynamac Corporation	Lisa Graczyk, Project Manager	20 North Wacker Drive, Suite 1210, Chicago, IL 60606	312-424-339 (office); 312-305-6745 (cell)
Weston Solutions, Inc.	David Wojcik, IL-certified asbestos inspector	20 North Wacker Drive, Suite 1210, Chicago, IL 60606	312-424-3329 (office); 630-370-0775 (cell)
	START Removal Oversight person – To be Determined		312-424-3314
	Trenna Seilheimer		260-348-4911

Roles and Responsibilities:

1.2 WESTON SUBCONTRACTORS

Organization/Branch	Name/Title	Address	Telephone
	Name: Title:	Street: City: State, Zip:	
	Name: Title:	Street: City: State, Zip:	
	Name: Title:	Street: City: State, Zip:	

Roles and Responsibilities:

SITE-SPECIFIC HEALTH AND SAFETY PERSONNEL

The Site Field Safety Officer (FSO) for activities to be conducted at this site is: Lisa Graczyk for site walkthrough; To Be Determined for removal oversight

The FSO has total responsibility for ensuring that the provisions of this Site HASP are adequate and implemented in the field.

Changing field conditions may require decisions to be made concerning adequate protection programs. Therefore, the personnel assigned as FSOs are experienced and meet the additional training requirements specified by OSHA in 29 CFR 1910.120.

Qualifications:

40 hr, 8 hr refresher, First Aid, CPR, AED, START

Designated alternates include: David Wojcik for site walkthrough; none for removal oversight (only one person for this)

1.3 SITE PERSONNEL AND CERTIFICATION STATUS

1.3.1 Weston Employee Certification

Name: Lisa Graczyk Title: Project Manager Task(s): Site Walkthrough Certification Level or Description: <input checked="" type="checkbox"/> Medical Current <input checked="" type="checkbox"/> Training Current <input type="checkbox"/> Fit Test Current (Qual.) <input checked="" type="checkbox"/> Fit Test Current (Quant.)	Name: David Wojcik Title: Asbestos Inspector Task(s): Site walkthrough, asbestos inspection and sampling, if required Certification Level or Description: <input checked="" type="checkbox"/> Medical Current <input checked="" type="checkbox"/> Training Current <input type="checkbox"/> Fit Test Current (Qual.) <input checked="" type="checkbox"/> Fit Test Current (Quant.)
Name: Trena Seilheimer Title: Project Geoscientist Task(s): Removal oversight Certification Level or Description: <input checked="" type="checkbox"/> Medical Current <input checked="" type="checkbox"/> Training Current <input type="checkbox"/> Fit Test Current (Qual.) <input checked="" type="checkbox"/> Fit Test Current (Quant.)	Name: Title: Task(s): Certification Level or Description: <input type="checkbox"/> Medical Current <input type="checkbox"/> Training Current <input type="checkbox"/> Fit Test Current (Qual.) <input type="checkbox"/> Fit Test Current (Quant.)
Name: Title: Task(s): Certification Level or Description: <input type="checkbox"/> Medical Current <input type="checkbox"/> Training Current <input type="checkbox"/> Fit Test Current (Qual.) <input type="checkbox"/> Fit Test Current (Quant.)	Name: Title: Task(s): Certification Level or Description: <input type="checkbox"/> Medical Current <input type="checkbox"/> Training Current <input type="checkbox"/> Fit Test Current (Qual.) <input type="checkbox"/> Fit Test Current (Quant.)
Name: Title: Task(s): Certification Level or Description: <input type="checkbox"/> Medical Current <input type="checkbox"/> Training Current <input type="checkbox"/> Fit Test Current (Qual.) <input type="checkbox"/> Fit Test Current (Quant.)	Name: Title: Task(s): Certification Level or Description: <input type="checkbox"/> Medical Current <input type="checkbox"/> Training Current <input type="checkbox"/> Fit Test Current (Qual.) <input type="checkbox"/> Fit Test Current (Quant.)
Name: Title: Task(s): Certification Level or Description: <input type="checkbox"/> Medical Current <input type="checkbox"/> Training Current <input type="checkbox"/> Fit Test Current (Qual.) <input type="checkbox"/> Fit Test Current (Quant.)	Name: Title: Task(s): Certification Level or Description: <input type="checkbox"/> Medical Current <input type="checkbox"/> Training Current <input type="checkbox"/> Fit Test Current (Qual.) <input type="checkbox"/> Fit Test Current (Quant.)
Name: Title: Task(s): Certification Level or Description: <input type="checkbox"/> Medical Current <input type="checkbox"/> Training Current <input type="checkbox"/> Fit Test Current (Qual.) <input type="checkbox"/> Fit Test Current (Quant.)	Name: Title: Task(s): Certification Level or Description: <input type="checkbox"/> Medical Current <input type="checkbox"/> Training Current <input type="checkbox"/> Fit Test Current (Qual.) <input type="checkbox"/> Fit Test Current (Quant.)

TRAINING CURRENT - Training: All personnel, including visitors, entering the exclusion or contamination reduction zones must have certifications of completion of training in accordance with OSHA 29 CFR 1910, 29 CFR 1926, or 29 CFR 1910.120.

FIT TEST CURRENT - Respirator Fit Testing: All persons, including visitors, entering any area requiring the use or potential use of any negative pressure respirator must have had, as a minimum, a qualitative fit test, administered in accordance with OSHA 29 CFR 1910.134 or ANSI, within the last 12 months. If site conditions require the use of a full-face, negative-pressure, air-purifying respirator for protection from asbestos or lead, employees must have had a qualitative fit test, administered according to OSHA 29 CFR 1910.1001 or 1025/1926, within the last 6 months.

MEDICAL CURRENT - Medical Monitoring Requirements: All personnel, including visitors, entering the exclusion or contamination reduction zones must be certified as medically fit to work and to wear a respirator, if appropriate, in accordance with 29 CFR 1910, 29 CFR 1926/1910, or 29 CFR 1910.120.

The Site Field Safety Officer is responsible for verifying all certifications and fit tests.

SITE PERSONNEL AND CERTIFICATION STATUS		
1.3.2 Subcontractor's Health and Safety Program Evaluation		
Name of Subcontractor: Address:		
Activities To Be Conducted by Subcontractor:		
Evaluation Criteria		
Medical program meets OSHA/WESTON criteria <input type="checkbox"/> Acceptable <input type="checkbox"/> Unacceptable Comments:	Personal protective equipment available <input type="checkbox"/> Acceptable <input type="checkbox"/> Unacceptable Comments:	On-site monitoring equipment available, calibrated, and operated properly <input type="checkbox"/> Acceptable <input type="checkbox"/> Unacceptable Comments:
Safe working procedures clearly specified <input type="checkbox"/> Acceptable <input type="checkbox"/> Unacceptable Comments:	Training meets OSHA/WESTON criteria <input type="checkbox"/> Acceptable <input type="checkbox"/> Unacceptable Comments:	Emergency procedures <input type="checkbox"/> Acceptable <input type="checkbox"/> Unacceptable Comments:
Decontamination procedures <input type="checkbox"/> Acceptable <input type="checkbox"/> Unacceptable Comments:	General health and safety program evaluation <input type="checkbox"/> Acceptable <input type="checkbox"/> Unacceptable Comments:	Additional comments: <input type="checkbox"/> Subcontractor has agreed to and will conform with the WESTON HASP for this project. <input type="checkbox"/> Subcontractor will work under his own HASP, which has been accepted by project PM.
Evaluation Conducted by: Certifications for all subcontractors personnel will be added to the HASP prior to beginning work. Date:		
Subcontractor		
Name: Title: Task(s): Certification Level or Description: <input type="checkbox"/> Medical Current <input type="checkbox"/> Training Current <input type="checkbox"/> Fit Test Current (Qual.) <input type="checkbox"/> Fit Test Current (Quant.)	Name: Title: Task(s): Certification Level or Description: <input type="checkbox"/> Medical Current <input type="checkbox"/> Training Current <input type="checkbox"/> Fit Test Current (Qual.) <input type="checkbox"/> Fit Test Current (Quant.)	
Name: Title: Task(s): Certification Level or Description: <input type="checkbox"/> Medical Current <input type="checkbox"/> Training Current <input type="checkbox"/> Fit Test Current (Qual.) <input type="checkbox"/> Fit Test Current (Quant.)	Name: Title: Task(s): Certification Level or Description: <input type="checkbox"/> Medical Current <input type="checkbox"/> Training Current <input type="checkbox"/> Fit Test Current (Qual.) <input type="checkbox"/> Fit Test Current (Quant.)	

2. HEALTH AND SAFETY EVALUATION

2.1 HEALTH AND SAFETY EVALUATION

2.1.1 Task Hazard Assessment

Background Review: ☒ Complete ☐ Partial If partial why?

Activities Covered Under This Plan:

No.	Task/Subtask	Description	Schedule
1	Site Walkthrough	Perform site walkthrough of area outside Rolling Mills Building and small laboratory building	August 26, 2009
2	Asbestos sampling, if required	Sample laboratory building materials, if inspection reveals suspect asbestos	August 26, 2009
3	Removal Oversight	documentation of removal activities (written and photographic), maintenance of OSC report files, and perimeter air sampling	September 8 – October 2, 2009

Types of Hazards:

Numbers refer to one of the following hazard evaluation forms. Complete hazard evaluation forms for each appropriate hazard class.

Physiochemical 1

- ☐ Flammable
- ☐ Explosive
- ☐ Corrosive
- ☐ Reactive
- ☐ O₂ Rich
- ☐ O₂ Deficient

Chemically Toxic 1

- ☐ Inhalation ☐ Carcinogen
- ☐ Ingestion ☐ Mutagen
- ☐ Contact ☐ Teratogen
- ☐ Absorption
- ☒ OSHA 1910.1000 Substance (Air Contaminants)
- ☐ OSHA Specific Hazard Substance Standard (Refer to following page for listing)

Radiation 3

- Ionizing:
- ☐ Internal exposure
 - ☐ External exposure
- Non-ionizing:
- ☒ UV ☐ IR
 - ☐ RF ☐ MicroW
 - ☐ Laser

Biological 2

- ☐ Etiological Agent
- ☒ Other (plant, insect, animal)

☒ Physical Hazards 4

- ☐ Construction Activities

Source/Location of Contaminants and Hazardous Substances:

Directly Related to Tasks

- ☒ Air
- ☐ Other Surface
- ☐ Groundwater
- ☐ Soil
- ☐ Surface Water
- ☐ Sanitary Wastewater
- ☐ Process Wastewater
- ☐ Other _____

Indirectly Related to Tasks — Nearby Process(es) That Could Affect Team Members:

- ☐ Client Facility/WESTON Work Location
- ☐ Nearby Non-Client Facility

Describe:

- ☐ Have activities (task[s]) been coordinated with facility?

Comments:

OSC is coordinating access.

HEALTH AND SAFETY EVALUATION

2.1.2 Chemical Hazards of Concern

☒ N/A

Chemical Contaminants of Concern

Provide the data requested for chemical contaminants on HASP Form 25 or attach data sheets from an acceptable source such as NIOSH pocket guide, condensed chemical dictionary, ACGIH TLV booklet, etc. List chemicals and concentrations below and locate data sheets in Attachment B of this HASP.

☒ N/A

Identify hazardous materials used or on-site and attach Material Safety Data Sheets (MSDSs) for all reagent type chemicals, solutions, or other identified materials that in normal use in performing tasks related to this project could produce hazardous substances. Ensure that all subcontractors and other parties working nearby are informed of the presence of these chemicals and the location of the MSDSs. Obtain from subcontractors and other parties, lists of the hazardous materials they use or have on-site and identify location of the MSDSs here. List chemicals and quantities below and locate MSDSs in Attachment B of this HASP.

Chemical Name	Concentration ()	Chemical Name	Quantity
asbestos	unk		

OSHA-SPECIFIC HAZARDOUS SUBSTANCES

<input checked="" type="checkbox"/> 1910.1001 Asbestos	<input type="checkbox"/> 1910.1002 Coal tar pitch volatiles	<input type="checkbox"/> 1910.1003 4-Nitrobiphenyl, etc.	<input type="checkbox"/> 1910.1004 alpha-Naphthylamine
<input type="checkbox"/> 1910.1005 [Reserved]	<input type="checkbox"/> 1910.1006 Methyl chloromethyl ether	<input type="checkbox"/> 1910.1007 3,3'-Dichlorobenzidine (and its salts)	<input type="checkbox"/> 1910.1008 bis-Chloromethyl ether
<input type="checkbox"/> 1910.1009 beta-Naphthylamine	<input type="checkbox"/> 1910.1010 Benzidine	<input type="checkbox"/> 1910.1011 4-Aminodiphenyl	<input type="checkbox"/> 1910.1012 Ethyleneimine
<input type="checkbox"/> 1910.1013 beta-Propiolactone	<input type="checkbox"/> 1910.1014 2-Acetylaminofluorene	<input type="checkbox"/> 1910.1015 4-Dimethylaminoazobenzene	<input type="checkbox"/> 1910.1016 N-Nitrosodimethylamine
<input type="checkbox"/> 1910.1017 Vinyl chloride	<input type="checkbox"/> 1910.1018 Inorganic arsenic	<input type="checkbox"/> 1910.1025 Lead (Att. FLD# 46)	<input type="checkbox"/> 1910.1026 Chromium VI (att. FLD 53)
<input type="checkbox"/> 1910.1027 Cadmium (Att. 50 FLD)	<input type="checkbox"/> 1910.1028 Benzene (Att. FLD# 54 or 61)	<input type="checkbox"/> 1910.1029 Coke oven emissions	<input type="checkbox"/> 1910.1043 Cotton dust
<input type="checkbox"/> 1910.1044 1,2-Dibromo-3-chloropropane	<input type="checkbox"/> 1910.1045 Acrylonitrile	<input type="checkbox"/> 1910.1047 Ethylene oxide	<input type="checkbox"/> 1910.1048 Formaldehyde
<input type="checkbox"/> 1910.1050 Methylenedianiline	<input type="checkbox"/> 1910.1051 1,3 Butadiene	<input type="checkbox"/> 1910.1052 Methylene chloride	<input type="checkbox"/> 1926.60 Methylenedianiline
<input type="checkbox"/> 1926.62 Lead	<input type="checkbox"/> 1926.1101 Asbestos (Att. FLD 52)	<input type="checkbox"/> 1926.1127 Cadmium	

HEALTH AND SAFETY EVALUATION	
2.1.3 Biological Hazards of Concern	
<input checked="" type="checkbox"/> Poisonous Plants (FLD 43-D) Location/Task No(s) 1,3 Source: <input type="checkbox"/> Known <input checked="" type="checkbox"/> Suspect Route of Exposure: <input type="checkbox"/> Inhalation <input type="checkbox"/> Ingestion <input checked="" type="checkbox"/> Contact <input type="checkbox"/> Direct Penetration Team Member(s) Allergic: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Immunization required: <input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Insects (FLD 43-B) Location/Task No(s) 1,3 Source: <input type="checkbox"/> Known <input checked="" type="checkbox"/> Suspect Route of Exposure: <input type="checkbox"/> Inhalation <input type="checkbox"/> Ingestion <input checked="" type="checkbox"/> Contact <input type="checkbox"/> Direct Penetration Team Member(s) Allergic: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Immunization required: <input type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> Snakes, Reptiles (FLD 43-A) Location/Task No(s) Source: <input type="checkbox"/> Known <input type="checkbox"/> Suspect Route of Exposure: <input type="checkbox"/> Inhalation <input type="checkbox"/> Ingestion <input type="checkbox"/> Contact <input type="checkbox"/> Direct Penetration Team Member(s) Allergic: <input type="checkbox"/> Yes <input type="checkbox"/> No Immunization required: <input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Animals (FLD 43-A) Location/Task No(s) 1,3 Source: <input type="checkbox"/> Known <input checked="" type="checkbox"/> Suspect Route of Exposure: <input type="checkbox"/> Inhalation <input type="checkbox"/> Ingestion <input checked="" type="checkbox"/> Contact <input type="checkbox"/> Direct Penetration Team Member(s) Allergic: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Immunization required: <input type="checkbox"/> Yes <input type="checkbox"/> No
FLD 43 — WESTON Biohazard Field Operating Procedures: Att. OP <input type="checkbox"/>	
<input type="checkbox"/> Sewage Location/Task No(s).: Source: <input type="checkbox"/> Known <input type="checkbox"/> Suspect Route of Exposure: <input type="checkbox"/> Inhalation <input type="checkbox"/> Ingestion <input type="checkbox"/> Contact <input type="checkbox"/> Direct Penetration Team Member(s) Allergic: <input type="checkbox"/> Yes <input type="checkbox"/> No Immunization required: <input type="checkbox"/> Yes <input type="checkbox"/> No Tetanus Vaccination within Past 10 yrs: <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Etiologic Agents (FLD -C)(List) Location/Task No(s).: Source: <input type="checkbox"/> Known <input type="checkbox"/> Suspect Route of Exposure: <input type="checkbox"/> Inhalation <input type="checkbox"/> Ingestion <input type="checkbox"/> Contact <input type="checkbox"/> Direct Penetration Team Member(s) Allergic: <input type="checkbox"/> Yes <input type="checkbox"/> No Immunization required: <input type="checkbox"/> Yes <input type="checkbox"/> No
FLD 43-C — Mold and Fungus. Att. OP <input type="checkbox"/>	
FLD 44 — WESTON Bloodborne Pathogens Exposure Control Plan – First Aid Procedures: Att. OP <input type="checkbox"/>	
FLD 45 — WESTON Bloodborne Pathogens Exposure Control Plan – Working with Infectious Waste: Att. OP <input type="checkbox"/>	

HEALTH AND SAFETY EVALUATION

2.1.4 Radiation Hazards of Concern

NONIONIZING RADIATION

Task No.	Type of Nonionizing Radiation	Source On-Site	TLV/PEL	Wavelength Range	Control Measures	Monitoring Instrument
1,3	Ultraviolet	Solar			Appropriate clothing/sunscreen	None
	Infrared	N/A				
	Radio Frequency	N/A				
	Microwave	N/A				
	Laser	N/A				

IONIZING RADIATION

Task No.	Radionuclide	Major Radiations	Radioactive Half-Life (Years)	DAC ($\mu\text{Ci}/\text{mL}$)			Surface Contamination Limit	Monitoring Instrument
				D	W	Y		

HEALTH AND SAFETY EVALUATION

2.1.5 Physical Hazards of Concern

Physical Hazard Condition	Physical Hazard	Attach OP	WESTON OP Titles
Loud noise	Hearing loss/disruption of communication	<input checked="" type="checkbox"/>	Section 7.0 - ECH&S Program Manual Occupational Noise & HC Program
Inclement weather	Rain/humidity/cold/ice/snow/lightning	<input type="checkbox"/>	FLD02 - Inclement Weather
Steam heat stress	Burns/displaced oxygen/wet working surfaces	<input type="checkbox"/>	FLD03 - Hot Process - Steam
Heat stress	Burns/hot surfaces/low pressure steam	<input type="checkbox"/>	FLD04 - Hot Process - LT3
Ambient heat stress	Heat rash/cramps/exhaustion/heat stroke	<input checked="" type="checkbox"/>	FLD05 - Heat Stress Prevention/Monitoring
Cold stress	Hypothermia/frostbite	<input type="checkbox"/>	FLD06 - Cold Stress
Cold/wet	Trench/paddy/immersion foot/edema	<input type="checkbox"/>	FLD02 - Inclement Weather
Confined spaces	Falls/burns/drowning/engulfment/electrocution	<input type="checkbox"/>	FLD08 - Confined Space Entry
Industrial Trucks	Fork Lift Truck Safety	<input type="checkbox"/>	FLD09 - Powered Industrial Trucks
Improper lifting	Back strain/abdomen/arm/leg muscle/joint injury	<input type="checkbox"/>	FLD10 - Manual Lifting/Handling Heavy Objects
Uneven surfaces	Vehicle accidents/slips/trips/falls	<input checked="" type="checkbox"/>	FLD11 - Rough Terrain
Poor housekeeping	Slips/trips/falls/punctures/cuts/fires	<input type="checkbox"/>	FLD12 - Housekeeping
Structural integrity	Crushing/overhead hazards/compromised floors	<input type="checkbox"/>	FLD13 - Structural Integrity
Improper cylinder, handling	Mechanical injury/fire/explosion/suffocation	<input type="checkbox"/>	FLD16 - Pressure Systems - Compressed Gases
Water hazards	Poor visibility/entanglement/drowning/cold stress	<input type="checkbox"/>	FLD17 - Diving
Water hazards	Drowning/heat/cold stress/hypothermia/falls	<input type="checkbox"/>	FLD18 - Operation and Use of Boats
Water hazards	Drowning/frostbite/hypothermia/falls/electrocution	<input type="checkbox"/>	FLD19 - Working Over Water
Vehicle hazards	Struck by vehicle/collision	<input type="checkbox"/>	FLD20 - Traffic
Explosions	Explosion/fire/thermal burns	<input type="checkbox"/>	FLD21 - Explosives
Moving mechanical parts	Crushing/pinch points/overhead hazards/electrocution	<input checked="" type="checkbox"/>	FLD22 - Earth Moving Equipment
Moving mech. parts	Overhead hazards/electrocution	<input type="checkbox"/>	FLD23 - Cranes, Rigging, and Slings
Working at elevation	Overhead hazards/falls/electrocution	<input type="checkbox"/>	FLD24 - Aerial Lifts/Man lifts
Working at elevation	Overhead hazards/falls/electrocution	<input type="checkbox"/>	FLD25 - Working at Elevation
Working at elevation	Overhead hazards/falls/electrocution/slips	<input type="checkbox"/>	FLD26 - Ladders
Working at elevation	Slips/trips/falls/overhead hazards	<input type="checkbox"/>	FLD27 - Scaffolding
Trench cave-in	Crushing/falling/overhead hazards/suffocation	<input type="checkbox"/>	FLD28 - Excavating/Trenching
Physiochemical	Explosions/fires from oxidizing, flam./corr. material	<input type="checkbox"/>	FLD30 - Hazardous Materials Use/Storage
Physiochemical	Fire and explosion	<input type="checkbox"/>	FLD31 - Fire Prevention/Response Plan Required
Physiochemical	Fire	<input type="checkbox"/>	FLD32 - Fire Extinguishers Required
Structural integrity	Overhead/electrocution/slips/trips/falls/fire	<input type="checkbox"/>	FLD33 - Demolition
Electrical	Electrocution/shock/thermal burns	<input type="checkbox"/>	FLD34 - Utilities
Electrical	Electrocution/shock/thermal burns	<input type="checkbox"/>	FLD35 - Electrical Safety
Burns/fires	Heat stress/fires/burns	<input type="checkbox"/>	FLD36 - Welding/Cutting/Brazing/Radiography
Impact/thermal	Thermal burns/high pressure impaction/heat stress	<input type="checkbox"/>	FLD37 - Pressure Washers/Sand Blasting
Impaction/electrical	Smashing body parts/pinching/cuts/electrocution	<input type="checkbox"/>	FLD38 - Hand and Power Tools
Poor visibility	Slips/trips/falls	<input type="checkbox"/>	FLD39 - Illumination
Fire/explosion	Burns/impaction	<input type="checkbox"/>	FLD40 - Storage Tank Removal/Decommissioning
Communications	Disruption of communications	<input type="checkbox"/>	FLD41 - Std. Hand/Emergency Signals
Energy/release	Unexpected release of energy	<input type="checkbox"/>	FLD42 - Lockout/Tag-out
Biological Hazards	Biological Hazards at site	<input type="checkbox"/>	FLD43 - Biological Hazards
Animals	Animals	<input checked="" type="checkbox"/>	FLD43A - Animals
Insects	Stinging and Biting Insects	<input checked="" type="checkbox"/>	FLD43B - Stinging and Biting Insects
Molds/Fungi	Molds and Fungi	<input type="checkbox"/>	FLD43C - Molds and Fungi
Hazardous Plants	Hazardous Plants	<input checked="" type="checkbox"/>	FLD43D - Hazardous Plants
Etiologic Agents	Etiologic Agents	<input type="checkbox"/>	FLD43E - Etiologic Agents

Biological Hazards/BBP	Biological Hazards/BBP at site/First Aid Providers	<input type="checkbox"/>	FLD44 - Biological Hazards – Bloodborne Pathogens Exposure Control Plan – First Aid Providers
2.1.5 Physical Hazards of Concern (Continued)			
Physical Hazard Condition	Physical Hazard	Attach OP	WESTON OP Titles
Infectious Waste	Infectious Waste at site/BBP/ at site/Infectious Waste	<input type="checkbox"/>	FLD45 – Biological Hazards – Bloodborne Pathogens Exposure Control Plan – Work With Infectious Waste
Lead Contaminated sites	Lead poisoning	<input type="checkbox"/>	FLD46 - Control of Exposure to Lead
Puncture/cuts	Cuts/ dismemberment/gouges	<input checked="" type="checkbox"/>	FLD47 - Clearing, Grubbing and Logging Operations
Not applicable	Not applicable	<input type="checkbox"/>	FLD48 – Federal, State, Local Regulatory Agency Inspections
Not applicable	Exposure to hazardous materials/waste	<input type="checkbox"/>	FLD49 – Safe Storage of Samples
Cadmium	Exposure Control	<input type="checkbox"/>	FLD50 – Cadmium Exposure Control Plan
Process Safety Procedure	Safety Procedure	<input type="checkbox"/>	FLD51 – Process Safety Procedure
Asbestos	Asbestos Exposure	<input checked="" type="checkbox"/>	FLD52 – Asbestos Exposure Control Plan
Hexavalent Chromium	Exposure Control Plan	<input type="checkbox"/>	FLD53 – Hexavalent Chromium Exposure Control Plan
Benzene	Exposure Control Plan	<input type="checkbox"/>	FLD54 - <u>Benzene Exposure Control Plan</u>
Hydrofluoric acid	Working with HF	<input type="checkbox"/>	FLD55 – Working with Hydrofluoric Acid
Moving drill rig parts	Crushing/pinch points/overhead hazards/electrocution	<input type="checkbox"/>	FLD56 – Drilling Safety
Vehicles/driving	Accidents,/fatigue/cell phone use	<input checked="" type="checkbox"/>	FLD 57 – Motor Vehicle Safety
Improper material handling	Back injury/crushing from load shifts/equipment/tools	<input type="checkbox"/>	FLD 58 – Drum Handling Operations
COC decontamination	COCs/slip,trip, and falls/waste generation/environmental compliance/PPE	<input type="checkbox"/>	FLD59 - Decontamination
Drilling hazards	Electrocution/overhead hazards/pinch points	<input type="checkbox"/>	Environmental Remediation Drilling Safety Guideline - 2005
Fatigue	Long work hours	<input checked="" type="checkbox"/>	FLD60 – Employee Duty Schedule
Benzene/Gasoline	Benzene exposure	<input type="checkbox"/>	FLD61 – Gasoline Contaminant Exposure

3. TASK BY TASK ASSESMENT

3.1 TASK-BY-TASK RISK ASSESSMENT

3.1.1 Task 1 Description

TASK 1: Site Walkthrough

EQUIPMENT REQUIRED/USED

Level D PPE

logbook

Camera

POTENTIAL HAZARDS/RISKS

Chemical

☐ Hazard Present

Risk Level: ☐ H ☐ M ☐ L

What justifies risk level?

Physical

☒ Hazard Present

Risk Level: ☐ H ☐ M ☒ L

What justifies risk level?

Work outdoors and in the abandoned lab building present the following hazards: rough terrain and slip/trip/fall. All work is scheduled to be conducted during daylight hours.

Biological

☒ Hazard Present

Risk Level: ☐ H ☐ M ☒ L

What justifies risk level?

A portion of the site walkthrough will be conducted in an open field east of the Rolling Mills building. There is a potential to come in contact with plants, insects, and animals. General awareness/avoidance and required PPE should address the hazards. If working in grassy or wooded areas, personnel should tie off their pantlegs, wear high boots/booties, or wear tyvek to protect from chiggers or other insects (ticks). Personnel should use insect repellent, including spraying their boots. If allergies are a factor, be aware of the surroundings and the plant life.

RADIOLOGICAL

☒ Hazard Present

Risk Level: ☐ H ☐ M ☒ L

What justifies risk level?

Work will be conducted outdoors. Personnel will be exposed to the sun (UV rays).

LEVELS OF PROTECTION/JUSTIFICATION

Level D PPE

SAFETY PROCEDURES REQUIRED AND/OR FIELD OPS UTILIZED

All work will be performed in accordance with the provisions of this HASP, OSHA guidelines, and WESTON Standard Operating Procedures.

3.1 TASK-BY-TASK RISK ASSESSMENT

3.1.2 Task 2 Description

TASK 2: Asbestos Sampling. Bulk building materials may be sampled if suspect asbestos containing materials are found in the laboratory building.

EQUIPMENT REQUIRED/USED

APR	logbook
P-100 HEPA cartridges	camera
Steel-toed boots	Sampling tools (hammer, chisel)
Hard hat	Ziploc baggies
Safety glasses	sharpie

POTENTIAL HAZARDS/RISKS

Chemical

☐ Hazard Present Risk Level: ☐ H ☐ M ☐ L

What justifies risk level?

Reportedly all chemical hazards have been removed and asbestos is the only potential hazard remaining.

Physical

☒ Hazard Present Risk Level: ☐ H ☐ M ☒ L

What justifies risk level?

Condition of laboratory building is unknown. There is a potential for slips/trips/falls and punctures while using asbestos sampling tools.

Biological

☐ Hazard Present Risk Level: ☐ H ☐ M ☐ L

What justifies risk level?

No biological hazards are anticipated inside the building.

RADIOLOGICAL

☐ Hazard Present Risk Level: ☐ H ☐ M ☐ L

What justifies risk level?

No radiological hazards are anticipated inside the building.

LEVELS OF PROTECTION/JUSTIFICATION

Level C PPE will be worn by the sampler

SAFETY PROCEDURES REQUIRED AND/OR FIELD OPS UTILIZED

All work will be performed in accordance with the provisions of this HASP, OSHA guidelines, and WESTON Standard Operating Procedures.

Applicable FLDs will be followed.

3.1 TASK-BY-TASK RISK ASSESSMENT

3.1.3 Task 3 Description

TASK 3: Removal Oversight

EQUIPMENT REQUIRED/USED

APR	logbook
P-100 cartridges	camera
Steel-toed boots	Air sampling pumps
Hard hat	Sampling media
Safety glasses	PDR

POTENTIAL HAZARDS/RISKS

Chemical

☐ Hazard Present Risk Level: ☐ H ☐ M ☐ L
What justifies risk level?

Physical

☒ Hazard Present Risk Level: ☐ H ☐ M ☒ L
What justifies risk level?

Work outdoors and in the abandoned lab building present the following hazards: rough terrain and slip/trip/fall. All work is scheduled to be conducted during daylight hours.

Biological

☒ Hazard Present Risk Level: ☐ H ☐ M ☒ L
What justifies risk level?

Removal of asbestos will be conducted in an open field east of the Rolling Mills building. There is a potential to come in contact with plants, insects, and animals. General awareness/avoidance and required PPE should address the hazards. If working in grassy or wooded areas, personnel should tie off their pant legs, wear high boots/booties, or wear tyvek to protect from chiggers or other insects (ticks). Personnel should use insect repellant, including spraying their boots. If allergies are a factor, be aware of the surroundings and the plant life.

RADIOLOGICAL

☒ Hazard Present Risk Level: ☐ H ☐ M ☒ L
What justifies risk level?

Work will be conducted outdoors. Personal will be exposed to the sun (UV rays). Proper PPE and/or sunscreen will be used as necessary.

LEVELS OF PROTECTION/JUSTIFICATION

Level C or Level D dependent on site activities. If site activities have the potential to cause asbestos to become airborne, then a full-face APR will be worn with P-100 cartridges (level C PPE). In addition if particulate emissions exceed regulatory levels, then level C PPE will also be worn.

SAFETY PROCEDURES REQUIRED AND/OR FIELD OPS UTILIZED

All work will be performed in accordance with the provisions of this HASP, OSHA guidelines, and WESTON Standard Operating Procedures.

3.1 TASK-BY-TASK RISK ASSESSMENT	
3.1.4 Task 4 Description	
TASK 4:	
EQUIPMENT REQUIRED/USED	
POTENTIAL HAZARDS/RISKS	
Chemical	
<input type="checkbox"/> Hazard Present What justifies risk level?	Risk Level: <input type="checkbox"/> H <input type="checkbox"/> M <input type="checkbox"/> L
Physical	
<input type="checkbox"/> Hazard Present What justifies risk level?	Risk Level: <input type="checkbox"/> H <input type="checkbox"/> M <input type="checkbox"/> L
Biological	
<input type="checkbox"/> Hazard Present What justifies risk level?	Risk Level: <input type="checkbox"/> H <input type="checkbox"/> M <input type="checkbox"/> L
RADIOLOGICAL	
<input type="checkbox"/> Hazard Present What justifies risk level?	Risk Level: <input type="checkbox"/> H <input type="checkbox"/> M <input type="checkbox"/> L
LEVELS OF PROTECTION/JUSTIFICATION	
SAFETY PROCEDURES REQUIRED AND/OR FIELD OPS UTILIZED	
All work will be performed in accordance with the provisions of this HASP, OSHA guidelines, and WESTON Standard Operating Procedures.	

3.1 TASK-BY-TASK RISK ASSESSMENT	
3.1.5 Task 4 Description	
TASK 5:	
EQUIPMENT REQUIRED/USED	
POTENTIAL HAZARDS/RISKS	
Chemical	
<input type="checkbox"/> Hazard Present What justifies risk level?	Risk Level: <input type="checkbox"/> H <input type="checkbox"/> M <input type="checkbox"/> L
Physical	
<input type="checkbox"/> Hazard Present What justifies risk level?	Risk Level: <input type="checkbox"/> H <input type="checkbox"/> M <input type="checkbox"/> L
Biological	
<input type="checkbox"/> Hazard Present What justifies risk level?	Risk Level: <input type="checkbox"/> H <input type="checkbox"/> M <input type="checkbox"/> L
RADIOLOGICAL	
<input type="checkbox"/> Hazard Present What justifies risk level?	Risk Level: <input type="checkbox"/> H <input type="checkbox"/> M <input type="checkbox"/> L
LEVELS OF PROTECTION/JUSTIFICATION	
SAFETY PROCEDURES REQUIRED AND/OR FIELD OPS UTILIZED	
All work will be performed in accordance with the provisions of this HASP, OSHA guidelines, and WESTON Standard Operating Procedures.	

3.2 PERSONNEL PROTECTION PLAN

Engineering Controls

Describe Engineering Controls used as part of Personnel Protection Plan:

Task(s)
All Be aware of the surroundings.

Administrative Controls

Describe Administrative Controls used as part of Personnel Protection Plan:

Task(s)
All Training for the use of equipment and work around potential hazardous materials
All Water will be available for hydration and personnel should monitor for potential heat stress
All Be aware of surroundings
All Distance will be maintained from all removal action activities unless upgraded PPE is donned.
All Distance will be maintained from excavator and other heavy machinery.

Personal Protective Equipment

Action Levels for Changing Levels of Protection. Refer to HASP Form 13, Site Air Monitoring Program—Action Levels. Define Action Levels for up or down grade for each task:

Task(s)
1 Level D
2 Level C
3 Level D or C dependent on work activities and air monitoring readings

Description of Levels of Protection

Level D	Level D Modified
<p>Task(s): 1,3</p> <p><input checked="" type="checkbox"/> Head Hard Hat</p> <p><input checked="" type="checkbox"/> Eye and Face Safety glasses</p> <p><input type="checkbox"/> Hearing</p> <p><input type="checkbox"/> Arms and Legs Only</p> <p><input type="checkbox"/> Appropriate Work Uniform</p> <p><input checked="" type="checkbox"/> Hand – Gloves Optional dependent on tasks</p> <p><input checked="" type="checkbox"/> Foot - Safety Boots Steeled toed boots</p> <p><input type="checkbox"/> Fall Protection</p> <p><input type="checkbox"/> Flotation</p> <p><input type="checkbox"/> Other</p>	<p>Task(s):</p> <p><input type="checkbox"/> Head</p> <p><input type="checkbox"/> Eye and Face</p> <p><input type="checkbox"/> Hearing</p> <p><input type="checkbox"/> Arms and Legs Only</p> <p><input type="checkbox"/> Whole Body</p> <p><input type="checkbox"/> Apron</p> <p><input type="checkbox"/> Hand - Gloves</p> <p><input type="checkbox"/> Gloves</p> <p><input type="checkbox"/> Gloves</p> <p><input type="checkbox"/> Foot - Safety Boots</p> <p><input type="checkbox"/> Over Boots</p>

3.3 DESCRIPTION OF LEVELS OF PROTECTION

Level C		Level B
Task(s): 2,3		Task(s):
<input checked="" type="checkbox"/> Head	Hard hat	<input type="checkbox"/> Head
<input checked="" type="checkbox"/> Eye and Face	Safety glasses	<input type="checkbox"/> Eye and Face
<input checked="" type="checkbox"/> Hearing	Ear plugs (when near heavy equipment)	<input type="checkbox"/> Hearing
<input type="checkbox"/> Arms and Legs Only		<input type="checkbox"/> Arms and Legs Only
<input checked="" type="checkbox"/> Whole Body	Tyvek	<input type="checkbox"/> Whole Body
<input type="checkbox"/> Apron		<input type="checkbox"/> Apron
<input type="checkbox"/> Hand - Gloves		<input type="checkbox"/> Hand - Gloves
<input checked="" type="checkbox"/> Gloves	Nitrile gloves	<input type="checkbox"/> Gloves
<input type="checkbox"/> Gloves		<input type="checkbox"/> Gloves
<input checked="" type="checkbox"/> Foot - Safety Boots	Steel-toed safety boots	<input type="checkbox"/> Foot - Safety Boots
<input checked="" type="checkbox"/> Outer Boots	Latex or tyvek booties	<input type="checkbox"/> Outer Boots
<input type="checkbox"/> Boots (Other)		<input type="checkbox"/> Boots (Other)
<input type="checkbox"/> Half Face		<input type="checkbox"/> SAR - Airline
<input type="checkbox"/> Cart./Canister		<input type="checkbox"/> SCBA
<input checked="" type="checkbox"/> Full Face	MSA ultra-twin	<input type="checkbox"/> Comb. Airline/SCBA
<input type="checkbox"/> Cart./Canister		<input type="checkbox"/> Cascade System
<input type="checkbox"/> PAPR		<input type="checkbox"/> Compressor
<input checked="" type="checkbox"/> Cart./Canister	P-100	<input type="checkbox"/> Fall Protection
<input type="checkbox"/> Type C		<input type="checkbox"/> Flotation
<input type="checkbox"/> Fall Protection		<input type="checkbox"/> Other
<input type="checkbox"/> Flotation		
<input type="checkbox"/> Other		

4. MONITORING PROGRAM

4.1 SITE OR PROJECT HAZARD MONITORING PROGRAM

4.1.1 Air Monitoring Instruments

Instrument Selection and Initial Check Record

Reporting Format: ☐ Field Notebook ☐ Field Data Sheets* ☐ Air Monitoring Log ☐ Trip Report ☐ Other

Instrument	Task No.(s)	Number Required	Number Received	Checked Upon Receipt	Comment	Initials
<input type="checkbox"/> RAD				<input type="checkbox"/>		
<input type="checkbox"/> GM (Pancake)				<input type="checkbox"/>		
<input type="checkbox"/> NaI (Micro R)				<input type="checkbox"/>		
<input type="checkbox"/> ZnS (Alpha Scintillator)				<input type="checkbox"/>		
<input type="checkbox"/> Other _____				<input type="checkbox"/>		
<input type="checkbox"/> PID				<input type="checkbox"/>		
<input type="checkbox"/> MiniRAE				<input type="checkbox"/>		
<input type="checkbox"/> MultiRAE (LEL/O2/H2S/CO/PID)				<input type="checkbox"/>		
<input type="checkbox"/> TVA 1000 (PID/FID)				<input type="checkbox"/>		
<input type="checkbox"/> Other _____				<input type="checkbox"/>		
<input type="checkbox"/> FID						
<input type="checkbox"/> TVA 1000 (FID/PID)				<input type="checkbox"/>		
<input type="checkbox"/> Other _____				<input type="checkbox"/>		
<input checked="" type="checkbox"/> PDR 1000 (Particulate)				<input type="checkbox"/>		
<input type="checkbox"/> Single Gas Meter (SGM)				<input type="checkbox"/>		
Specify Chemical:				<input type="checkbox"/>		
<input type="checkbox"/> Personal Sampling Pump				<input type="checkbox"/>		
Specify Media:				<input type="checkbox"/>		
<input type="checkbox"/> Bio-Aerosol Monitor				<input type="checkbox"/>		
<input type="checkbox"/> Detector Tube Pump:				<input type="checkbox"/>		
Specify (MSA, Dräger, Sensidyne)						
<input type="checkbox"/> Tubes/type: _____						
<input type="checkbox"/> Tubes/type: _____						
<input type="checkbox"/> Tubes/type: _____						
<input type="checkbox"/> Tubes/type: _____						

4.1 SITE OR PROJECT HAZARD MONITORING PROGRAM

4.1.1 Air Monitoring Instruments Calibration Record

[illegible]

4.2 SITE AIR MONITORING PROGRAM

Action Levels

These Action Levels, if not defined by regulation, are some percent (usually 50%) of the applicable PEL/TLV/REL. That number must also be adjusted to account for instrument response factors.

	Tasks	Action Level		Action
<input type="checkbox"/> Explosive atmosphere		Ambient Air Concentration	Confined Space Concentration	
		<10% LEL	0 to 1% LEL	Work may continue. Consider toxicity potential.
		10 to 25% LEL	1 to 10% LEL	Work may continue. Increase monitoring frequency.
		>25% LEL	>10% LEL	Work must stop. Ventilate area before returning.
<input type="checkbox"/> Oxygen		Ambient Air Concentration	Confined Space Concentration	
		<19.5% O ₂	<19.5% O ₂	Leave area. Re-enter only with self-contained breathing apparatus.
		19.5% to 25% O ₂	19.5% to 23.5% O ₂	Work may continue. Investigate changes from 21%.
		>25% O ₂	>23.5% O ₂	Work must stop. Ventilate area before returning.
<input type="checkbox"/> Radiation		< 3 times background 3 times background to < 1 mR/hour		Continue work. Radiation above background levels (normally 0.01-0.02 mR/hr) signifies possible radiation source(s) present. Continue investigation with caution. Perform thorough monitoring. Consult with a Health Physicist.
		> 1 mrem/hour		Potential radiation hazard. Evacuate site. Continue investigation only upon the advice of Health Physicist.
<input type="checkbox"/> Organic gases and vapors				
<input checked="" type="checkbox"/> Inorganic gases, vapors, and particulates	3	Total particulates > 2.5 mg/m ³		Implement more stringent dust control measure
				Stop work and re-evaluate

4.3 ACTION LEVELS

(Attach action level calculations)

5. HOSPITAL INFORMATION

5.1 CONTINGENCIES

5.1.1 Emergency Contacts and Phone Numbers

Agency	Contact	Phone Number
WorkCare WESTON Medical Director WorkCare WESTON Program Administrator	Dr. Peter Greaney Michelle Bui	From 6 am to 4:30 pm Pacific Time call 800-455-6155 dial 0 or extension 175, Michelle Bui to request the on-call clinician.
After-Business Hours Contact (In Case of Emergency Only)		4:31 p.m. – 5:59 a.m. Pacific Time, all day Saturday, Sunday and Holidays call 800-455-6155 Dial 3 to reach the after-hours answering service. Request that the service connect you with the on-call clinician or the on-call clinician will return your call within 30 minutes.
WESTON Corporate Environmental Health & Safety Director	Owen B. Douglass, Jr.	610.701.3065 610.506.5392 (cell)
WESTON Medical Programs Manager	Carol Tarka	760.603.9910
WESTON Health & Safety Division Safety Manager	Ted Deecke	847 337 4147
WESTON Health & Safety Local Safety Officer	Tonya Balla	847 528 2623
Fire Department	Fire Dept	911
Police Department	Police	911
WESTON FSO Cell Phone	Lisa Graczyk/TBD <i>Trena Seilheimer</i>	312-305-6745/TBD 260-348-4911
WESTON PM Cell Phone	Lisa Graczyk	312-305-6745
Client Site Phone	Theresa Holz	312-802-0676
Site Telephone	TBD	TBD
Nearest Telephone	TBD	TBD
Poison Control		(800) 222-1222

Local Medical Emergency Facility(s)

Name of Hospital: Illinois Valley Community Hospital		
Address: 925 West Street, Peru, Illinois 61354		Phone No.: (815) 223-3300
Name of Contact:		Phone No.:
Type of Service: <input type="checkbox"/> Physical trauma only <input type="checkbox"/> Chemical exposure only <input checked="" type="checkbox"/> Physical trauma and chemical exposure <input checked="" type="checkbox"/> Available 24 hours	Route to Hospital: (See Attached)	Travel time from site: 7 minutes Distance to hospital: 2.6 miles Name/no. of 24-hr ambulance service: 911

Secondary or Specialty Service Provider

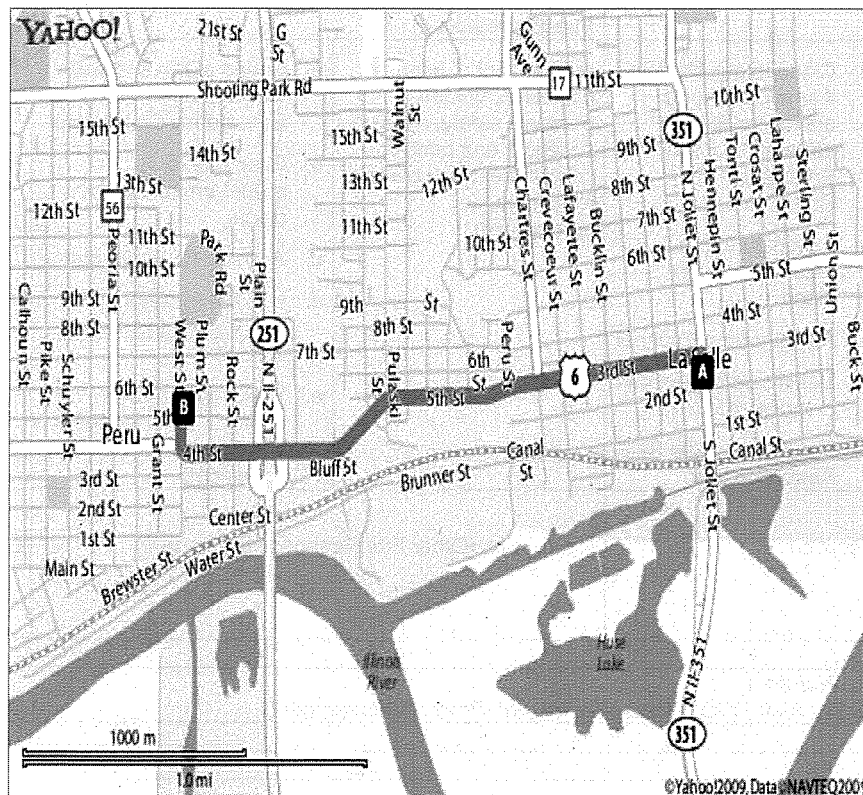
Name of Hospital:		
Address:		Phone No.:
Name of Contact:		Phone No.:
Type of Service: <input type="checkbox"/> Physical trauma only <input type="checkbox"/> Chemical exposure only <input type="checkbox"/> Physical trauma and chemical exposure <input type="checkbox"/> Available 24 hours	Route to Hospital (see attached):	Travel time from site: Distance to hospital: Name/no. of 24-hr ambulance service: /

See reporting an incident in Attachment F.

5.1.2 Hospital Map

Distance	
A 1. Starting in LA SALLE, IL on N JOLIET ST go toward 3RD ST	go 197 ft
2. Turn L on 3RD ST(US-6)	go 0.6 mi
3. Continue to follow US-6	go 1.04 mi
4. Turn R on WEST ST	go 472 ft
B 5. Arrive at 925 WEST ST, PERU, on the R	

Time: 7 mins, Distance: 1.77 mi



When using any driving directions or map, it's a good idea to do a reality check and make sure the road still exists, watch out for construction, and follow all traffic safety precautions. This is only to be used as an aid in planning.

5.1 CONTINGENCIES				
5.1.3 Response Plans				
Medical - General Provide first aid, if trained; assess and determine need for further medical assistance. Transport or arrange for transport after appropriate decontamination.		First Aid Kit: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Type Standard 20-man and infection control kit	Location In.Vehicle
		Blood Borne Pathogens Kit: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Special First-Aid Procedures: Cyanides on-site <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, contact LMF. Do they have antidote kit? <input type="checkbox"/> Yes <input type="checkbox"/> No
		Eyewash required <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Type	Location
		Shower required <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Type	Location
Plan for Response to Spill/Release		Plan for Response to Fire/Explosion		Fire Extinguishers
In the event of a spill or release, ensure safety, assess situation, and perform containment and control measures, as appropriate.		In the event of a fire or explosion, ensure personal safety, assess situation, and perform containment and control measures, as appropriate:		Type/Location <u>ABC/Vehicle</u> / / / / / /
a. Cleanup per MSDSs if small; or sound alarm, call for assistance, notify Emergency Coordinator b. Evacuate to pre-determined safe place c. Account for personnel d. Determine if team can respond safely e. Mobilize per Site Spill Response Plan		a. Sound alarm and call for assistance, notify Emergency Coordinator b. Evacuate to predetermined safe place c. Account for personnel d. Use fire extinguisher <u>only if safe and trained</u> in its use e. Stand by to inform emergency responders of materials and conditions		
Description of Spill Response Gear	Location	Description (Other Fire Response Equipment)		Location
Plan to Respond to Security Problems Avoid confrontation. Call 911. Alert OSC, Weston Safety and Project Management.				

6. DECONTAMINATION PLAN

6.1 GENERAL DECONTAMINATION PLAN

Personnel Decontamination

Consistent with the levels of protection required, step-by-step procedures for personnel decontamination for each level of protection are attached.

Levels of Protection Required for Decontamination Personnel

The levels of protection required for personnel assisting with decontamination will be:

☐

Level B

☐

Level C

☒

Level D

Modifications include:

Disposition of Decontamination Wastes

Provide a description of waste disposition including identification of storage area, hauler, and final disposal site, if applicable

Investigation-derived wastes are defined as any byproduct of the field activities that is suspected or known to be contaminated with hazardous substances. The oversight of field activities will produce spent Personal Protective Equipment (PPE). All waste generated will be left on site in a staging area with U.S. EPA approval. ERRS will dispose of PPE during the removal activities.

Equipment Decontamination

A procedure for decontamination steps required for non-sampling equipment and heavy machinery follows:

Not applicable – all equipment will be dedicated.

Sampling Equipment Decontamination

Sampling equipment will be decontaminated in accordance with the following procedure:

Not applicable – all equipment will be dedicated.

6.2 LEVEL D DECONTAMINATION PLAN

Check indicated functions or add steps, as necessary:

Function	Description of Process, Solution, and Container
<input type="checkbox"/> Segregated equipment drop	
<input type="checkbox"/> Boot cover and glove wash	
<input type="checkbox"/> Boot cover and glove rinse	
<input checked="" type="checkbox"/> Tape removal - outer glove and boot	Place in trash bag.
<input checked="" type="checkbox"/> Boot cover removal	Place in trash bag.
<input checked="" type="checkbox"/> Outer glove removal	Place in trash bag.
HOTLINE	
<input type="checkbox"/> Suit/safety boot wash	
<input type="checkbox"/> Suit/boot/glove rinse	
<input type="checkbox"/> Safety boot removal	
<input type="checkbox"/> Suit removal	
<input type="checkbox"/> Inner glove wash	
<input type="checkbox"/> Inner glove rinse	
<input type="checkbox"/> Inner glove removal	
<input type="checkbox"/> Inner clothing removal	
CONTAMINATION REDUCTION ZONE (CRZ)/SAFE ZONE BOUNDARY	
<input type="checkbox"/> Field wash	
<input type="checkbox"/> Redress	
Disposal Plan, End of Day:	
Disposal Plan, End of Week:	
Disposal Plan, End of Project:	

6.3 LEVEL C DECONTAMINATION PLAN

Check indicated functions or add steps, as necessary:

Function	Description of Process, Solution, and Container
<input type="checkbox"/> Segregated equipment drop	
<input type="checkbox"/> Boot cover and glove wash	
<input type="checkbox"/> Boot cover and glove rinse	
<input checked="" type="checkbox"/> Tape removal - outer glove and boot	Place in trash bag.
<input checked="" type="checkbox"/> Boot cover removal	Place in trash bag.
<input checked="" type="checkbox"/> Outer glove removal	Place in trash bag.
HOTLINE	
<input type="checkbox"/> Suit/safety boot wash	
<input type="checkbox"/> Suit/boot/glove rinse	
<input type="checkbox"/> Safety boot removal	
<input type="checkbox"/> Suit removal	
<input type="checkbox"/> Inner glove wash	
<input type="checkbox"/> Inner glove rinse	
<input type="checkbox"/> Facepiece removal	
<input type="checkbox"/> Inner glove removal	
<input type="checkbox"/> Inner clothing removal	
CONTAMINATION REDUCTION ZONE (CRZ)/SAFE ZONE BOUNDARY	
<input checked="" type="checkbox"/> Field wash	
<input type="checkbox"/> Redress	
Disposal Plan, End of Day: All waste generated will be left on site in a staging area with U.S. EPA approval.	
Disposal Plan, End of Week: All waste generated will be left on site in a staging area with U.S. EPA approval.	
Disposal Plan, End of Project: All waste generated will be left on site in a staging area with U.S. EPA approval.	

6.4 LEVEL B DECONTAMINATION PLAN	
Check indicated functions or add steps, as necessary:	
Function	Description of Process, Solution, and Container
<input type="checkbox"/> Segregated equipment drop	
<input type="checkbox"/> Boot cover and glove wash	
<input type="checkbox"/> Boot cover and glove rinse	
<input type="checkbox"/> Tape removal - outer glove and boot	
<input type="checkbox"/> Boot cover removal	
<input type="checkbox"/> Outer glove removal	
HOTLINE	
<input type="checkbox"/> Suit/safety boot wash	
<input type="checkbox"/> Suit/SCBA/boot/glove rinse	
<input type="checkbox"/> Safety boot removal	
<input type="checkbox"/> Remove SCBA backpack without disconnecting	
<input type="checkbox"/> Splash suit removal	
<input type="checkbox"/> Inner glove wash	
<input type="checkbox"/> Inner glove rinse	
<input type="checkbox"/> SCBA disconnect and facepiece removal	
<input type="checkbox"/> Inner glove removal	
<input type="checkbox"/> Inner clothing removal	
CONTAMINATION REDUCTION ZONE (CRZ)/SAFE ZONE BOUNDARY	
<input type="checkbox"/> Field wash	
<input type="checkbox"/> Redress	
Disposal Plan, End of Day: 	
Disposal Plan, End of Week: 	
Disposal Plan, End of Project: 	

7. TRAINING AND BRIEFING TOPICS/SIGN OFF SHEET

7.1 TRAINING AND BRIEFING TOPICS

The following items will be covered at the site-specific training meeting, daily or periodically.

<input checked="" type="checkbox"/> Site characterization and analysis, Sec. 3.0, 29 CFR 1910.120 l	<input type="checkbox"/> Level A
<input checked="" type="checkbox"/> Physical hazards, HASP Form 07	<input type="checkbox"/> Level B
<input type="checkbox"/> Chemical hazards, HASP Form 04	<input checked="" type="checkbox"/> Level C
<input type="checkbox"/> Animal bites, stings, and poisonous plants	<input checked="" type="checkbox"/> Level D
<input type="checkbox"/> Etiologic (infectious) agents	<input type="checkbox"/> Monitoring, 29 CFR 1910.120 (h)
<input checked="" type="checkbox"/> Site control, 29 CFR 1910.120 d	<input type="checkbox"/> Decontamination, 29 CFR 1910.120 (k)
<input checked="" type="checkbox"/> Engineering controls and work practices, 29 CFR 1910.120 (g)	<input type="checkbox"/> Emergency response, 29 CFR 1910.120 (l)
<input type="checkbox"/> Heavy machinery	<input type="checkbox"/> Elements of an emergency response, 29 CFR 1910.120 (l)
<input type="checkbox"/> Forklift	<input checked="" type="checkbox"/> Procedures for handling site emergency incidents, 29 CFR 1910.120 (l)
<input type="checkbox"/> Backhoe	<input type="checkbox"/> Off-site emergency response, 29 CFR 1910.120 (l)
<input type="checkbox"/> Equipment	<input type="checkbox"/> Handling drums and containers, 29 CFR 1910.120 (j)
<input type="checkbox"/> Tools	<input type="checkbox"/> Opening drums and containers
<input type="checkbox"/> Ladder, 29 CFR 1910.27 (d)/29 CFR 1926	<input type="checkbox"/> Electrical material handling equipment
<input type="checkbox"/> Overhead and underground utilities	<input type="checkbox"/> Radioactive waste
<input type="checkbox"/> Scaffolds	<input type="checkbox"/> Shock-sensitive waste
<input type="checkbox"/> Structural integrity	<input type="checkbox"/> Laboratory waste packs
<input type="checkbox"/> Unguarded openings - wall, floor, ceilings	<input type="checkbox"/> Sampling drums and containers
<input type="checkbox"/> Pressurized air cylinders	<input type="checkbox"/> Shipping and transport, 49 CFR 172.101, IATA
<input checked="" type="checkbox"/> Personal protective equipment, 29 CFR 1910.120 (g); 29 CFR 1910.134	<input type="checkbox"/> Tank and vault procedures
<input checked="" type="checkbox"/> Respiratory protection, 29 CFR 1910.120 (g); ANSI Z88.2	<input type="checkbox"/> Illumination, 29 CFR 1910.120 (m)
<input type="checkbox"/> Working over water FLD-19	<input type="checkbox"/> Sanitation, 29 CFR 1910.120 (n)
<input type="checkbox"/> Boating safety FLD-18	<input type="checkbox"/>
<input checked="" type="checkbox"/> Heat Stress	<input type="checkbox"/>
<input type="checkbox"/> Proper lifting techniques	<input type="checkbox"/>

7.2 HEALTH AND SAFETY PLAN APPROVAL/SIGNOFF FORM

Site Name: M&H Zinc Fund Lead RV

WO#: 20405.012.001.0729.00

Address: 1375 9th Street, LaSalle, IL

I understand, agree to, and will conform with the information set forth in this Health and Safety Plan (and attachments) and discussed in the personnel health and safety briefing(s).

Name

Signature

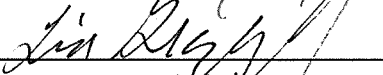
Date

DAVID Wojcik



23 Aug 09

Lisa Graczyk



8-26-09

Trenna Seilheimer



8-27-09

ATTACHMENT A

CHEMICAL CONTAMINANTS DATA SHEETS

Insert sheets on following page.


[CDC Home](#)
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[CDC Health Topics A-Z](#)
NIOSH National Institute for
Occupational Safety and Health

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NIOSH Publication 2005-149

September 2005

NIOSH Pocket Guide to Chemical Hazards

[NPG Home](#) | [Introduction](#) | [Synonyms & Trade Names](#) | [Chemical Names](#) | [CAS Numbers](#) | [RTECS Numbers](#) | [Appendices](#) | [Search](#)

Asbestos

CAS 1332-21-4

Hydrated mineral silicates

RTECS Cl6475000

Synonyms & Trade Names

Actinolite, Actinolite asbestos, Amosite (cummingtonite-grunerite), Anthophyllite, Anthophyllite asbestos, Chrysotile, Crocidolite (Riebeckite), Tremolite, Tremolite asbestos

DOT ID & Guide

2212 171 (blue, brown)
2590 171 (white)

Exposure Limits

NIOSH REL: Ca See Appendix A See Appendix C

OSHA PEL: [1910.1001] [1926.1101] See Appendix C

IDLH Ca [N.D.] See: IDLH INDEX

Conversion

Physical Description

White or greenish (chrysotile), blue (crocidolite), or gray-green (amosite) fibrous, odorless solids.

MW: Varies

BP: Decomposes

MLT: 1112°F (Decomposes)

Sol: Insoluble

VP: 0 mmHg (approx)

IP: NA

Sp.Gr: ?

F.P: NA

UEL: NA

LEL: NA

Noncombustible Solids

Incompatibilities & Reactivities

None reported

Measurement Methods

NIOSH 7400, 7402; OSHA ID160, ID191

See: NMAM or OSHA Methods

Personal Protection & Sanitation (See protection codes)

Skin: Prevent skin contact

Eyes: Prevent eye contact

Wash skin: Daily

Remove: No recommendation

Change: Daily

First Aid (See procedures)

Eye: Irrigate immediately

Breathing: Fresh air

Respirator Recommendations (See Appendix E) NIOSH

At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:

(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. [Click here](#) for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection

Exposure Routes

inhalation, ingestion, skin and/or eye contact

Symptoms Asbestosis (chronic exposure): dyspnea (breathing difficulty), interstitial fibrosis, restricted pulmonary function, finger clubbing; irritation eyes; [potential occupational carcinogen]

Target Organs respiratory system, eyes

Cancer Site [lung cancer]

See also: INTRODUCTION See MEDICAL TESTS: 0019

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NIOSH Publication No. 2005-149:

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NIOSH Pocket Guide to Chemical Hazards

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Particulates not otherwise regulated

CAS

RTECS

Synonyms & Trade Names

"Inert" dusts, Nuisance dusts, PNOR [Note: Includes all inert or nuisance dusts, whether mineral, inorganic, not listed specifically in 1910.1000.]

DOT ID & Guide

Exposure Limits

NIOSH REL: See Appendix D

 OSHA PEL: TWA 15 mg/m³ (total) TWA 5 mg/m³ (resp)

IDLH N.D. See: IDLH INDEX

Conversion

Physical Description

Dusts from solid substances without specific occupational exposure standards.

 Properties vary depending upon
the specific solid.

Incompatibilities & Reactivities

Varies

Measurement Methods

NIOSH 0500, 0600

 See: [NMAM](#) or [OSHA Methods](#)

Personal Protection & Sanitation (See protection)

Skin: No recommendation

Eyes: No recommendation

Wash skin: No recommendation

Remove: No recommendation

Change: No recommendation

First Aid (See procedures)

Eye: Irrigate immediately

Breathing: Fresh air

Respirator Recommendations Not available.

Important additional information about respirator selection

Exposure Routes inhalation, skin and/or eye contact

Symptoms Irritation eyes, skin, throat, upper respiratory system

Target Organs Eyes, skin, respiratory system

 See also: [INTRODUCTION](#)
[NIOSH Home](#) | [NIOSH Search](#) | [Site Index](#) | [Topic List](#) | [Contact Us](#)

ATTACHMENT B
MATERIAL SAFETY DATA SHEETS
(ATTACH MSDSS)

Insert documents on following page.

ATTACHMENT C

SAFETY PROCEDURES/FIELD OPERATING PROCEDURES (FLD OPS)

Insert documents on following page.

FLD 05 HEAT STRESS PREVENTION AND MONITORING

Heat stress may occur at any time work is performed at elevated temperatures. If the body's physiological processes fail to maintain a normal body temperature because of excessive heat, a number of physical reactions can occur such as fatigue, irritability, anxiety, and decreased concentration or dexterity, and possibly death. Because heat stress is one of the most common and potentially serious illnesses at field sites, regular monitoring and other preventive measures are vital to ensure worker safety. Wearing chemical protective clothing often decreases natural body heat loss (cooling) and increases the risk of heat stress.

Employees who are taking prescription or over-the-counter medications should consult with their personal physician prior to working in high-temperature environments to see if their medication would impair their ability to handle heat stress.

REFERENCES

OSHA 29 CFR 1910 and 1926

RELATED FLDs

FLD 02 – Inclement Weather

FLD 03 – Hot Processes – Steam, Low Temperature Thermal Treatment Unit, and Transportable Incinerator

FLD 08 – Confined Space Entry Program

FLD 36 – Welding/Cutting/Burning

FLD 37 – Pressure Washers/Sandblasting

PROCEDURE

Heat Stress Symptoms and Treatment

Heat Rash

Heat rash, also known as prickly heat, may occur in hot and humid environments where sweat is not easily removed from the surface of the skin by evaporation and is aggravated by chafing clothes. When extensive or complicated by infection, heat rash can be so uncomfortable that it inhibits sleep and impairs a worker's performance.

Symptoms – Mild red rash, especially in areas of the body that come into contact with protective gear.

Treatment – Decrease amount of time spent working in protective gear and provide body powder to help absorb moisture and decrease chafing. Heat rash can be prevented by showering, resting in a cool place, and allowing the skin to dry.

Heat Cramps

Heat cramps are caused by inadequate electrolyte intake. The individual may be receiving adequate water; however, if not combined with an adequate supply of electrolytes, the blood can thin to the point where it seeps into the active muscle tissue, causing cramping.

Symptoms – Acute painful spasms of voluntary muscles, most notably the abdomen and extremities.

Treatment – Move the victim to a cool area and loosen clothing. Have the victim drink 1 to 2 cups of lightly salted water or diluted commercial electrolyte solution (e.g., Gatorade, Quench) immediately, and then every 20 minutes thereafter until symptoms subside. Electrolyte supplements can enhance recovery however, it is best to double the amount of water required by the dry mix package directions or add water to the liquid form.

Heat Exhaustion

Heat exhaustion is a state of weakness or exhaustion caused by the loss of fluids from the body. The condition is much less dangerous than heat stroke, but it nonetheless must be treated.

Symptoms – Pale, clammy, and moist skin, profuse perspiring, and extreme weakness. Body temperature is normal, pulse is weak and rapid, and breathing is shallow. The person may have a headache, may vomit, may feel dizzy, and may be irritable or confused.

Treatment – Move the victim to a cool, air-conditioned or temperature-controlled area, loosen clothing, place in a position with the head lower than the feet (shock prevention), and allow the victim to rest. Consult a physician. Have the victim drink 1 to 2 cups of water immediately, and every 20 minutes thereafter until symptoms subside. Seek medical attention at the advice of the consulting physician.

Heat Stroke

Heat stroke is an acute and dangerous reaction to heat stress caused by a failure of the body's heat regulating mechanisms (i.e., the individual's temperature control system [sweating] stops working correctly). Body temperature rises so high that brain damage and death may result if the person is not cooled quickly.

Symptoms – Red, hot, dry skin (although the person may have been sweating earlier); nausea, dizziness, confusion, extremely high body temperature, rapid respiratory and pulse rate, seizures or convulsions, unconsciousness or coma.

Treatment – Immediately call for emergency medical assistance. Remove the victim from the source of heat and cool the victim quickly. If the body temperature is not brought down quickly, permanent brain damage or death may result. Soak the victim in cool (not cold) water, sponge the body with cool water, or pour water on the body to reduce the temperature to a safe level (less than 102°F). Monitor the victim's vital signs. If possible, have the victim drink cool water. Do not give the victim coffee, tea, or alcoholic beverages.

Recognition and Risk Assessment

In the planning stages of a project, the potential for heat stress disorders must be considered as a physical hazard in the site-specific Health and Safety Plan (HASP). Risk assessment can be accomplished in the development stages of a project by listing in the HASP the most likely heat stress disorders that may occur. The Field Safety Officer (FSO) must make decisions on the proper safety procedures and recommend them to the site manager. Each worker must evaluate the risk associated with his or her work and be actively alert to these hazards. Any site worker may stop work if safety procedures are not followed or the risk is too great. In addition, all site personnel must be aware of these symptoms in both themselves and their co-workers.

Prevention and Protection Programs

Heat stress is affected by several interacting factors including, but not limited to, age, obesity, physical condition, substance abuse, level of personal protective equipment (PPE) worn, and environmental conditions (temperature, shade, and humidity). Site workers must learn to recognize and treat the various forms of heat stress. The following recommendations should be followed to prevent heat stress:

- The most important measure to prevent heat-related illness is adequate fluid intake. Workers should drink 1/2 to 1 quarts of liquids per hour in high heat conditions. Most of this liquid should be water. Under heavy work and heat conditions, the body may lose up to 2 gallons of fluids per day. To prevent heat stress symptoms, the individual must ensure replacement of this fluid.
- Provide disposable cups that hold about 4 ounces, and water that is maintained at 50 to 60°F. Workers should drink 16 ounces of water before beginning work, and a cup or two at each break period.
- Provide a shaded area for rest breaks. Ensure that adequate shelter is available to protect personnel against heat and direct sunlight. When possible, shade the work area.
- Discourage the intake of caffeinated drinks during working hours.
- Monitor for signs of heat stress.
- Encourage workers to maintain a good diet during these periods. In most cases, a balanced diet and lightly salted foods should help maintain the body's electrolyte balance. Bananas are especially good for maintaining the body's potassium level.
- If utilizing commercial electrolyte mixes, double the amount of water called for in the package directions. Indications are that "full-strength" preparations taken under high heat stress conditions may actually decrease the body's electrolytes.
- Acclimate workers to site work conditions by slowly increasing workloads (i.e., do not begin work activities with extremely demanding tasks).
- Rotate shifts of workers who are required to wear impervious clothing in hot weather.
- Encourage workers to wear lightweight, light-colored, loose-fitting clothing.
- In extremely hot weather, conduct field activities in the early morning and evening.
- Provide cooling devices to aid natural body heat regulation. These devices, however, add weight and their use should be balanced against worker efficiency. An example of a cooling aid is long cotton underwear, which acts as a wick to absorb moisture and protect the skin from direct contact with heat-absorbing protective clothing.
- Good hygienic standards must be maintained by frequent showering and changes of clothing.
- Clothing should be permitted to dry during rest periods.
- Whenever working in the sun, provide employees with sunscreen with both UVA and UVB protection.
- Persons who notice skin problems should immediately consult medical personnel.

Heat Stress Monitoring and Work Cycle Management

When strenuous field activities are part of on-going site work conducted in hot weather, the following guidelines should be used to monitor the body's physiological response to heat, and to manage the work cycle, even if workers are not wearing impervious clothing. These procedures should be instituted when the temperature exceeds 70°F and the tasks/risk analysis indicates an increased risk of heat stress

problems. Consult the HASP and a safety professional (e.g., Division EHS Manager, FSO) if questions arise as to the need for specific heat stress monitoring. In all cases, the site personnel must be aware of the signs and symptoms of heat stress and provide adequate rest breaks and proper aid as necessary.

Measure Heart Rate – Heart rate should be measured by the radial pulse for 30 seconds as early as possible in the rest period. The heart rate at the beginning of the rest period should not exceed 110 beats per minute. If the heart rate is higher, the next work period should be shortened by 33%, while the length of the rest period stays the same. If the pulse rate still exceeds 110 beats per minute at the beginning of the next rest period, the following work cycle should be further shortened by 33%. The procedure is continued until the rate is maintained below 110 beats per minute.

Measure Body Temperature – When ambient temperatures are over 90°F, body temperatures should be measured with a clinical thermometer as early as possible in the rest period. If the oral temperature exceeds 99.6°F (or 1 degree change from baseline) at the beginning of the rest period, the following work cycle should be shortened by 33%. The procedure is continued until the body temperature is maintained below 99.6°F (or 1 degree change from baseline). Under no circumstances should a worker be allowed to work if their oral temperature exceeds 100.6°F.

Measure Body Water Loss – Body water loss greater than 1.5% of total body weight is indicative of a heat stress condition. Body weight is measured before PPE is donned and after the PPE is removed following a work cycle. Body water loss can be measured with an ordinary bathroom scale; however, the scale must be sensitive to one-half pounds increments. A worker is required to drink additional fluids and rest if their body water loss is greater than 1.5%.

NOTE: For purposes of this operating practice, a break is defined as a 15-minute period and/or until an individual's vital signs are within prescribed guidelines.

A physiological monitoring schedule is determined by following the steps below:

- Measure the air temperature with a standard thermometer.
- Estimate the fraction of sunshine by judging what percent the sun is out (refer to Table 1).
- Calculate the adjusted temperature based on the following formula:
Adjusted Temperature = Actual Temperature + 13 X (where X = sunshine fraction from Table 1)
- Using Table 2, determine the physiological monitoring schedule for fit and acclimated workers for the calculated adjusted temperature.

The length of work period is governed by frequency of physiological monitoring (Table 2). The length of the rest period is governed by physiological parameters (heart rate and oral temperature).

**Table 1. Percent Sunshine Factors
Heat Stress Prevention and Monitoring**

Percent Sunshine (%)	Cloud Cover	Sunshine fraction
100	No cloud cover	1.0
50	50% cloud cover	0.5
0	Full cloud cover	0.0

**Table 2. Physiological Monitoring Schedule
Heat Stress Prevention and Monitoring**

Adjusted Temperature	Level D (Permeable clothing)	Level C, B, or A (Nonpermeable clothing)
90°F (32.2°C) or above	After each 45 minutes of work	After each 15 minutes of work
87.5°F (30.8° - 32.2°C)	After each 60 minutes of work	After each 30 minutes of work
82.5° - 87.5°F (28.1° - 32.2°C)	After each 90 minutes of work	After each 60 minutes of work
77.5° - 82.5°F (25.3° - 28.1°C)	After each 120 minutes of work	After each 90 minutes of work
72.5° - 77.5°F (22.5° - 25.3°C)	After each 150 minutes of work	After each 120 minutes of work

Example: Site personnel anticipate wearing level C (impermeable clothing) during site activities. The air temperature is 80°F and there are no clouds in the sky (100% sunshine). The adjusted temperature is calculated in the following manner:

Adjusted Temperature (Adj T °F) = Actual Temperature (Amb T °F) + (13 x sunshine fraction)

Adj T °F = 80°F + (13 x 1.0)

Adj T °F = 93°F

Using Table 2, the pulse rate, oral temperature and body water loss monitoring would be conducted after each 15 minutes of work. The adjusted temperature may need to be redetermined if the percent sunshine and ambient temperature changes drastically during site work.

If an individual's heart rate exceeds 110 beats per minute at the beginning of the rest period, that individual will continue to rest until his or her heart rate drops to baseline; the next work period is then decreased by 33%.

FLD 11 ROUGH TERRAIN/ATV USE

RELATED FLDs

FLD 02 – Inclement Weather

FLD 05 – Heat Stress Prevention and Monitoring

FLD 06 – Cold Stress

FLD 22 – Heavy Equipment Operation

FLD 47 – Clearing, Grubbing, and Logging Operations

FLD 57 – Motor Vehicle Safety

HAZARD

Physical hazards associated with rough terrain include vehicle accidents, heavy equipment incidents, falling, slipping, and tripping.

Driving vehicles on uneven surfaces creates a possibility of the vehicle rolling, getting stuck in mud or ditches, or of an accident due to flat tires or striking obstacles and other vehicles.

When working on foot, steep inclines and heavy or downed vegetation can hide holes or breaks in the terrain, increasing the risk of slips, trips, and falls.

RECOGNITION AND RISK ASSESSMENT

Rough terrain complicates work activities and adds to or increases risk. In the planning stages of a project, rough terrain must be considered as a physical hazard and identified in the site-specific health and safety plan (HASp). Risk assessment is usually accomplished from site history information (i.e., site topography) and on site by the Field Safety Officer (FSO).

HAZARD PREVENTION AND PROTECTION PROGRAMS

Safety on Foot

Personnel working on rough terrain should maintain a high level of physical conditioning due to increased body stress and exertion.

The site crew should be alert and observe terrain while walking to minimize slips, trips, and falls.

Boots should be ankle high or higher to provide additional support and stability.

Work will be completed in adequate natural light or sufficient illumination will be maintained.

Site personnel will conduct an initial walkover and the “buddy system” will be implemented.

Emergency communications such as a cell phone or two-way radio should be carried at all times.

Personnel should be aware of potential hazards and ensure the availability of first-aid supplies and knowledge of the location of the nearest medical assistance.

VEHICLE SAFETY

Vehicle drivers and passengers will wear seatbelts at all times.

Hazards can be prevented by ensuring regular maintenance is performed on vehicles and all safety features are working. Have brakes and wheel bearings of vehicles used off road or in four wheel drive inspected at increased frequency (suggest inspections at twice the manufacturer's recommended frequency).

In order to minimize accidents, site surveillance on foot may be required to ensure clear driving paths.

Minimize side hill travel. Travel straight up and down hills whenever possible. Passengers will not be allowed when side hill travel is required.

Take into account loads or superstructure of vehicles which raise the center of gravity and increase risk of tipping.

Cross streams, small logs or other passable (there is adequate clearance of the undercarriage) obstructions at right angles.

Four wheel drive vehicles should be used if terrain conditions are wet, frozen, broken, or otherwise deemed unsafe for two wheel drive vehicles by the FSO. Use of vehicles off-road will be specifically addressed in the HASP and personnel operating vehicles will be checked for proficiency.

- Before moving a vehicle in the field, first walk the route of travel, inspecting for depressions, stumps, gullies, ruts, and similar obstacles.
- Always check the brakes of a vehicle before traveling, particularly on rough, uneven, or hilly ground.
- Check the complete drive train of a carrier at least weekly for loose or damaged bolts, nuts, studs, shafts, and mountings.
- Engage the all wheel drive when traveling off highway on hilly terrain.
- Increase tire pressures before traveling in hilly terrain (do not exceed rated tire pressure).
- Use the assistance of someone on the ground as a guide when lateral or overhead clearance is close.
- After the vehicle/equipment has been moved to a new site, set all brakes and/or locks. When grades are steep, block the wheels.

Definitions

Class I, All-terrain vehicle (ATV): A motorized off-highway vehicle, 50 in. (127 cm) or less in width, having dry weight of 800 lbs (362.9 kg) or less, and traveling on three or more low pressure tires (10 lbs [4.5 kg] psi or less), with a seat designed to be straddled by the operator.

Class I, Category G, ATV: An ATV intended for general recreational and utility use.

Class I, Category U, ATV: An ATV intended primarily for utility use.

Class II, ATV: A motorized off-highway vehicle with a width which exceeds 50 in. (127 cm) or having a dry weight that exceeds 800 lbs (362.9 kg), traveling on four or more low-profile, low-pressure tires (10 lbs [4.5 kg] psi or less) and having a bench seat.

NOTE: Utility Vehicles are designed to perform off-road utility tasks such as passenger and cargo transportation and are addressed separately below. Examples are Rangers, Rhino, M-Gators, Gators, and Mules.

Rollover Protective Structure (ROPS). A cab or frame that provides a safe environment for the tractor operator in the event of a rollover.

ALL TERRAIN VEHICLES (ATVS)

Qualifications

ATV operators will have completed a nationally recognized accredited ATV training course (such as provided by the Specialty Vehicles Institute of America or in-house resources that have been certified as trainers by an accredited organization) prior to operation of the vehicle.

The operator must pass an operating skills test prior to being allowed to operate an ATV. Proof of completion of this training will be maintained.

Equipment

All ATVs shall be equipped with:

- An operable audible warning device (horn);
- Headlights (if it will be used during hours of darkness);
- Taillights; and
- Brake lights.
- Mufflers and spark arresters.

All Class II ATVs will be equipped with ROPS and seatbelts

Operation

Only Class I and Class II ATVs with four or more wheels may be used. Class III ATV's may not be used.

The manufacturer's recommended payload will not be exceeded at any time.

Gloves and an approved motorcycle helmet with full-face shield or goggles will be worn at all times while operating a Class I ATV.

An ATV will not be driven on public roadways except to cross the roadway, and it will only be driven on a public roadway at designated crossing points or with a road guard (no paved road use unless allowed by the manufacturer).

A copy of the operator's manual will be kept on the vehicle and protected from the elements (if practicable).

Tires shall be inflated to the pressures recommended by the manufacturer.

Passengers are prohibited on Class I ATVs.

UTILITY VEHICLES

Utility vehicles are defined as specialty Class II ATVs designed to perform off-road utility tasks such as passenger and cargo transportation. Examples are Rangers, Rhino, M-Gators, Gators, and Mules.

Utility vehicle operators shall be trained and familiar with the use of all controls; understand proper moving, stopping, turning and other operating characteristics of the vehicle. Operators must review all training materials provided by the manufacturer for the specific vehicles, and training should be in accordance with appropriate manufacturer recommendations. A copy of the operator's manual shall be kept on the vehicle at all times and protected from the elements. At a minimum, training should address:

- Basic riding tips from the manufacturer's published literature for each vehicle.
- Reading terrain.
- Climbing hilly terrain.
- Descending a hill.
- Traversing a slope.
- Riding through water.
- Cargo carriers and accessories.
- Loading and unloading.
- Troubleshooting.
- Proper preventative maintenance, (i.e., oil levels, tire pressure requirements and scheduled maintenance requirements according to the manufacturer's guidelines.).

Utility vehicles shall be equipped with:

- Operable audible warning device (horn).
- Headlights.
- Taillights.
- Brake lights.
- Seatbelts.
- ROPS.

Occupancy in utility vehicles is limited to manufacturer designated seating that has built-in seatbelts. Passengers may not ride in the vehicle's back cargo area unless the vehicle is otherwise equipped. Note: When used for emergency response, medical litters may be placed in the back cargo area but must be secured as described below.

The manufacturer's recommended load carrying capacity, personnel capacity, or maximum safe vehicle speed shall not be exceeded at any time.

Cargo items will be secured as necessary to prevent movement/tipping. All loads over fifty pounds (to include medical litters) must be securely strapped to cargo tie-downs in the rear and to the cargo shelf in the front.

Seatbelts will be worn by operators and passengers of specialty vehicles where installed by the manufacturer. Operators and passengers shall wear goggles at all times when a utility vehicle, not equipped with a windshield, is in motion.

Utility vehicles will not normally be driven on public roadways except to cross the roadway, and will only be driven on a public roadway at designated crossing points or with a road guard. Utility vehicles that are allowed to operate outside a controlled work area and/or on public roads will meet the minimum vehicle safety standards in accordance with 49 CFR 571.5, to include ROPs, seatbelts and placement of "Slow Moving Vehicle" emblems where required.

Manufacturer-installed safety equipment will be maintained in working order and used in compliance with the requirement of this regulation and in accordance with manufacturer's recommendations.

RULES

Observe the following practices to help prevent accidents:

- Do not misuse utility vehicles.
- Reduce speed and exercise extreme caution on slopes or on rough ground.
- Do not overload vehicle and avoid shifting loads. Reduce load when operating over rough or hilly terrain.
- Do not stop or start suddenly when going uphill or downhill. Be especially cautious when changing direction on slopes.
- Stay alert for holes, rocks, and other hidden hazards in the terrain.
- Keep away from drop-offs, ditches, embankments, as well as ponds and other bodies of water. The machine could suddenly turn over if a wheel is over the edge of a cliff or ditch, or if an edge caves in.
- Keep front wheels straight at crest of hill or going over bumps.
- When descending a hill, remove foot from accelerator and apply brakes to reduce speed and maintain control.

Transport Loads Safely

- Be sure load is evenly distributed.
- Do not load above the load guard.
- Securely anchor all loads in cargo box.
- Reduce cargo box capacity when operating on rough or hilly terrain.
- Use existing trails. Avoid terrain such as dangerous slopes and impassable swamps. Watch carefully for sharp bumps, holes, ruts, or obstacles.
- Look ahead at terrain. Know what is coming and be prepared to react. Be alert for hazards.
- Keep front wheels straight at the crest of a hill or going over bumps.
- Reduce speed according to trail, terrain, and visibility conditions.
- The passenger should always use the hand holds.

Climbing or Descending a Hill

- Always use the brakes when going down slopes, the utility vehicle can speed up (freewheel) going down a slope. Engine or clutch braking effect is minimal.
- Balance loads evenly and secure them. Braking could shift the load and affect vehicle stability.
- Sit on the center of the seat and keep both feet within the foot platform.
- Never drive past the limit of visibility. Slow down near the crest of a hill until getting a clear view of the other side.
- If the vehicle stops or loses power going up a hill, lock the park brake to hold the vehicle on slope. Maintain direction of travel and release the brake slowly. Back straight down hill slowly while maintaining control. Do not turn the vehicle sideways. The vehicle is more stable in a straight forward or rearward position.
- If the utility vehicle begins to tip, turn the front wheel downhill to gain control before proceeding.

Riding Through Water

- Avoid water whenever possible. If the drive belt becomes wet, slippage will occur and the vehicle will lose power.
- Never cross any body of water where the depth may be unknown to the operator. As an operational guideline, deep water is considered anything in excess of 152 mm (6 in.) in depth. Tires may float, making it difficult to maintain control.
- Choose a course within the waterway where both banks have a gradual incline. Cross at a point known to be safe.
- Proceed at a slow steady speed to avoid submerged obstacles and slippery rocks.
- Avoid water crossings where the operation of a utility vehicle may cause damage to waterway beds or erode waterway shoreline.

FLD 22 EARTH MOVING EQUIPMENT/MATERIAL HANDLING EQUIPMENT

REFERENCES

29 CFR Part 1926 Subparts 600-602

RELATED FLDs

FLD 23 – Cranes, Rigging, and Slings

FLD 24 – Aerial Lifts/Manlifts

FLD 34 – Utilities

FLD 35 – Electrical Safety

PROCEDURE

These rules apply to the following types of earthmoving equipment: scrapers, loaders, crawler or wheel tractors, bulldozers, off-highway trucks, graders, agricultural and industrial tractors, and similar equipment.

Machinery and Mechanized Equipment Safety

Before any machinery or mechanized equipment is placed in use, it will be inspected and tested by a competent mechanic and certified to be in safe operating condition.

WESTON will designate a competent person to be responsible for the inspection of all machinery and equipment daily and during use to make sure it is in safe operating condition. Tests will be made at the beginning of each shift during which the equipment is to be used to determine that the brakes and operating systems are in proper working condition.

Preventative maintenance procedures recommended by the manufacturer will be followed.

Any machinery or equipment found to be unsafe shall be removed from service and its use prohibited until unsafe conditions have been repaired or corrected.

Inspections or determinations of road conditions and structures will be made in advance to ensure that clearances and load capacities are safe for the passing or placement of any machinery or equipment.

Machinery and mechanized equipment will be operated only by designated personnel. Equipment deficiencies observed at any time that affect safe operation will be corrected before continuing operation.

Seat belts shall be provided on all equipment covered by this section and shall meet the requirements of the Society of Automotive Engineers (J386-1969) and Seat Belts for Construction Equipment. Seat belts for agricultural and light industrial tractors shall meet the seat belt requirements of Society of Automotive Engineers (J333a-1970), Operator Protection for Agricultural and Light Industrial Tractors.

Seat belts shall be worn when provided by the manufacturer. Passengers shall not be allowed to ride on equipment unless equipment is designed with additional seats with safety belts.

Audible alarms. All bi-directional machines, such as rollers, compactors, front-end loaders, bulldozers, and similar equipment, shall be equipped with a horn, distinguishable from the surrounding noise level, which shall be operated as needed when the machine is moving in either direction. The horn shall be maintained in an operative condition.

Getting off or on any equipment while it is in motion is prohibited.

Machinery or equipment requiring an operator will not be permitted to run unattended.

Machinery or equipment will not be operated in a manner that will endanger persons or property, nor will the safe operating speeds or loads be exceeded.

All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done. The only exemption is equipment designed to be serviced or maintained while running.

All repairs on machinery or equipment will be made at a location that will provide protection from traffic or other hazards to maintenance personnel.

Machinery and equipment, or parts thereof, that are suspended or held apart by slings, hoists, or jacks also will be substantially blocked or cribbed before personnel are permitted to work underneath or between them.

Bulldozer and scraper blades, front end-loader buckets, dump bodies, and similar equipment will be either fully lowered or blocked when being repaired or when not in use. All controls will be in a neutral position, with the engines stopped and brakes set, unless work being performed on the machine requires otherwise.

Stationary machinery and equipment will be placed on a firm foundation and secured before being operated.

All points requiring lubrication during operation will have fittings so located or guarded to be accessible without hazardous exposure.

When necessary, all mobile equipment and the operating area will be adequately illuminated while work is in progress.

Mechanized equipment will be shut down prior to and during fueling operations. Closed systems, with automatic shutoff that will prevent spillage if connections are broken, may be used to fuel diesel powered equipment left running.

All towing devices used on any combinations of equipment will be securely mounted and structurally adequate for the weight drawn.

Persons will not be permitted to get between a piece of towing equipment and the item being towed until the towing equipment has come to a complete stop.

All equipment with windshields will be equipped with powered wipers. Vehicles that operate under conditions that cause fogging or frosting of windshields will be equipped with operable defogging or defrosting devices.

All equipment left unattended at night, adjacent to a highway in normal use, or adjacent to construction areas where work is in progress, will have lights or reflectors, or barricades equipped with lights or reflectors, to identify the location of the equipment.

Whenever the equipment is parked, the parking brake will be set. Equipment parked on inclines will have the wheels chocked or track mechanism blocked and the parking brake set. Equipment such as lift trucks and stackers will have the rated capacity posted on the vehicle so as to be clearly visible to the operator. When auxiliary removable counterweights are provided by the manufacturer, corresponding alternate rated capacities also will be clearly shown on the vehicle. The ratings will not be exceeded.

Steering or spinner knobs will not be attached to the steering wheel unless the steering mechanism prevents road reactions from causing the steering hand wheel to spin. When permitted, the steering knob will be mounted within the periphery of the wheel.

All industrial trucks in use will meet the requirements of design, construction, stability, inspection, testing, maintenance, and operation, defined in American National Standards Institute (ANSI) B56.1, Safety Standards for Powered Industrial Trucks.

The installation of live booms on material and personnel hoists is prohibited.

The controls of loaders, excavators, or similar equipment with folding booms or lift arms will not be operated from a ground position unless so designed.

Personnel will not work or pass under the buckets or booms of loaders in operation.

Cranes and any other equipment used for lifting must be inspected as required and records of inspection must be maintained.

Drill Rigs

See FLD 56, *Drilling Safety*

FLD 43 B INSECTS

Sting and Biting Insects

Contact with stinging insects may result in site personnel experiencing adverse health affects that range from being mildly uncomfortable to being life threatening. Therefore, stinging insects present a serious hazard to site personnel and extreme caution must be exercised whenever site and weather conditions increase the risk of encountering stinging insects. These include the following:

- Bees ("Killer" bees, honeybees, bumble bees, wasps, and hornets and wingless wasps)
- Scorpions
- Fire ants
- Spiders

Bees, Wasps, Hornets and Yellow Jackets

The severity of an insect sting reaction varies from person to person. A normal reaction will result in pain, swelling and redness confined to the sting site. Simply disinfect the area (washing with soap and water will do) and apply ice to reduce the swelling.

A large local reaction will result in swelling that extends beyond the sting site. For example, a sting on the forearm could result in the entire arm swelling twice its normal size.

Although alarming in appearance, this condition is often treated the same as a normal reaction. An unusually painful or very large local reaction may need medical attention. Because this condition may persist for two to three days, antihistamines and corticosteroids are sometimes prescribed to lessen the discomfort.

Yellow jackets, hornets and wasps can sting repeatedly. Honeybees have barbed stingers that are left behind in their victim's skin. These stingers are best removed by a scraping action, rather than a pulling motion, which may actually squeeze more venom into the skin.

Personnel should be very cautious of "killer" bees. They have the appearance of the typical honeybee, however, they are very aggressive. These Africanized honeybees (AHB) defend their colonies much more vigorously than typical bees. The colonies are easily disturbed (sometimes just by being nearby). When they do sting, many more bees may participate, so there is a danger of receiving more stings. This can make them life threatening, especially to people allergic to stings, or with limited capacity to escape (the young, old, and handicapped).

Scorpions

Scorpion stings are a major public health problem in many underdeveloped tropical countries. For every person killed by a poisonous snake, 10 are killed by a poisonous scorpion. In Mexico, 1000 deaths from scorpion stings occur per year. In the United States, only 4 deaths in 11 years have occurred as a result of scorpion stings. Furthermore, scorpions can be found outside their

normal range of distribution, ie, when they accidentally crawl into luggage, boxes, containers, or shoes and are unwittingly transported home via human travelers.

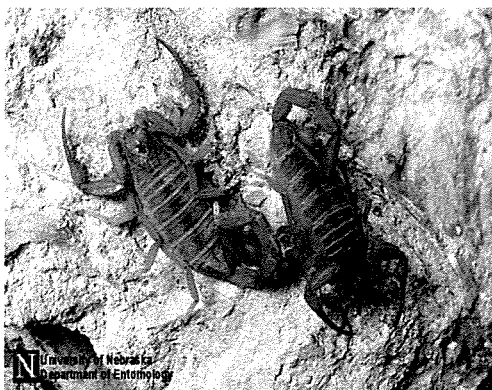
Out of 1500 scorpion species, 50 are dangerous to humans. Scorpion stings cause a wide range of conditions, from severe local skin reactions to neurologic, respiratory, and cardiovascular collapse.

Almost all of these lethal scorpions, except the *Hemiscorpius* species, belong to the scorpion family called the Buthidae. The Buthidae family is characterized by a triangular-shaped sternum, as opposed to the pentagonal-shaped sternum found in the other 5 scorpion families. In addition to the triangular-shaped sternum, poisonous scorpions also tend to have weak-looking pincers, thin bodies, and thick tails, as opposed to the strong heavy pincers, thick bodies, and thin tails seen in nonlethal scorpions. The lethal members of the Buthidae family include the genera of *Buthus*, *Parabuthus*, *Mesobuthus*, *Tityus*, *Leiurus*, *Androctonus*, and *Centruroides*. These lethal scorpions are found generally in the given distribution:

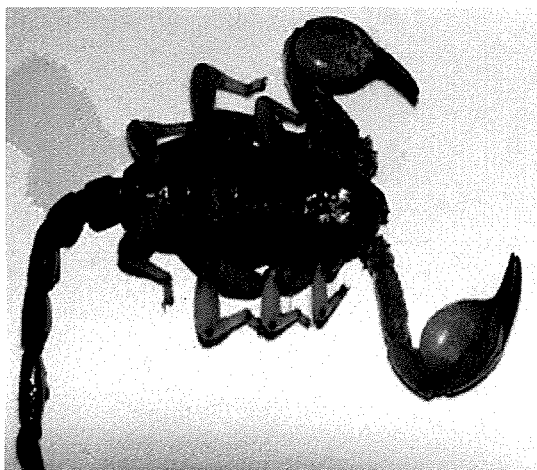
<i>Centruroides</i> - Southwest USA, Mexico, Central America	<i>Tityus</i> - Central and South America, Caribbean
<i>Buthus</i> - Mediterranean area	<i>Androctonus</i> - Northern Africa to Southeast Asia
<i>Leiurus</i> - Northern Africa and Middle East	<i>Mesobuthus</i> - Asia
<i>Parabuthus</i> - Western and Southern Africa	

A scorpion has a flattened elongated body and can easily hide in cracks. It has 4 pairs of legs, a pair of claws, and a segmented tail that has a poisonous spike at the end. Scorpions vary in size from 1-20 cm in length.

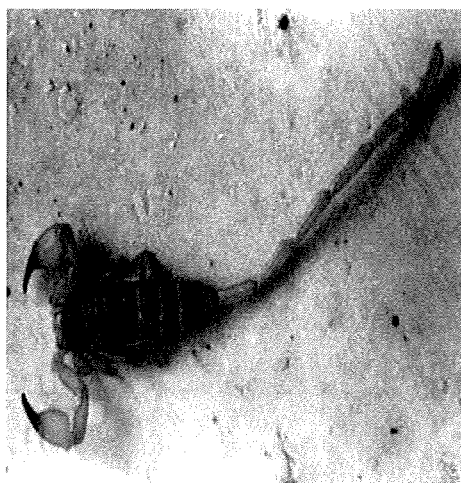
However, scorpions may be found outside their habitat range of distribution when inadvertently transported with luggage and cargo.



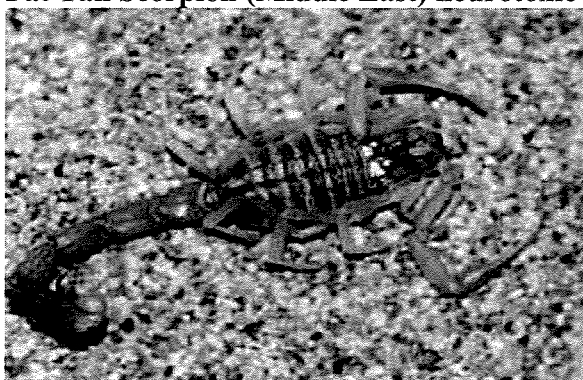
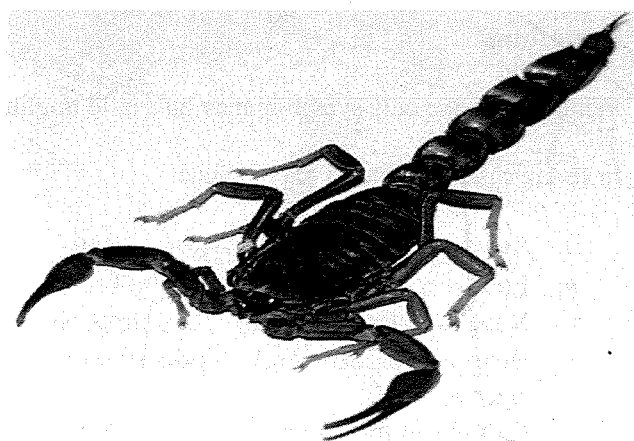
Centruroides (Southwest USA, Mexico)



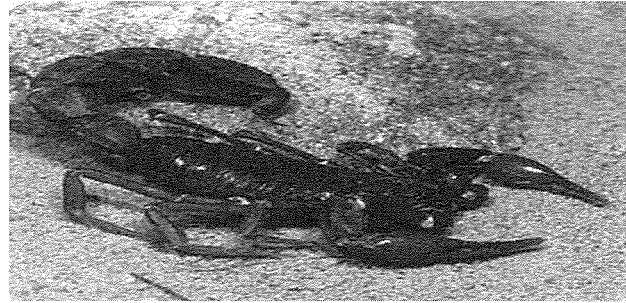
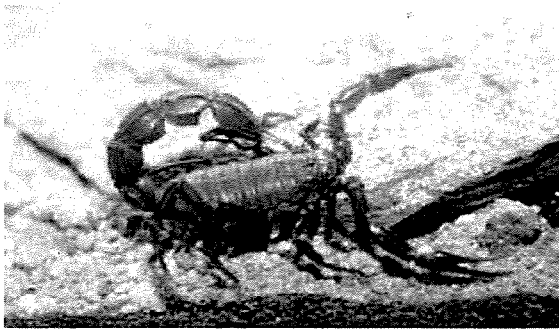
Hemiscorpius (Middle East) cytotoxic



Fat Tail Scorpion (Middle East) neurotoxic



Death Stalker *Leiurus quinquestriatus* (Africa Southwest and North) neurotoxic



Black Scorpion (Middle East) deadly neurotoxin

Prevention

Preventive measures include awareness of scorpions, shaking out clothing and boots before putting them on looking before reaching into likely hiding places and wearing gloves, long sleeved shirts and pants.

Symptoms

In mild cases, the only symptom may be a mild tingling or burning at site of sting.

In severe cases, symptoms may include:

- Eyes and ears - Double vision
- Lungs - Difficulty breathing, No breathing, Rapid breathing,
- Nose, mouth, and throat – Drooling, Spasm of the voice box, Thick-feeling tongue
- Heart and blood - High blood pressure, Increased or decreased heart rate, Irregular heartbeat
- Kidneys and bladder Urinary incontinence, Urine output, decreased
- Muscles and joints - Muscle spasms
- Nervous system – Paralysis, Random movements of head, eye, or neck, Restlessness, Seizures, Stiffness
- Stomach and intestinal tract - Abdominal cramps, Fecal incontinence
- Other -Convulsions

Treatment

1. Recognize scorpion sting symptoms:
2. Wash the area with soap and water.
3. Apply a cool compress on the area of the scorpion sting. Ice (wrapped in a washcloth or other suitable covering) may be applied to the sting location for 10 minutes. Remove compress for 10 minutes and repeat as necessary.
4. Call the Poison Control Center. If you develop symptoms of a poisonous scorpion sting, go to the nearest emergency care facility.
5. Keep your tetanus shots and boosters current.

Fire Ants

Fire ants are aggressive, reddish-brown to black ants that are 1/8 inch to 1/4 inch long. They construct nests, which are often visible as dome-shaped mounds of soil, sometimes as large as 3 feet across and 1 1/2 feet in height. In sandy soils, mounds are flatter and less visible. Fire ants usually build mounds in sunny, open areas such as lawns, pastures, cultivated fields and meadows, but they are not restricted to these areas. Mounds or nests may be located in rotting logs, around trees and stumps, under pavement and buildings, and occasionally indoors.

Fire ants use their stingers to immobilize or kill prey and to defend ant mounds from disturbance by larger animals, such as humans. Any disturbance sends hundreds of workers out to attack anything that moves. The ant grabs its victim with its mandibles (mouthparts) and then inserts its stinger. The process of stinging releases a chemical, which alerts other ants, inducing them to sting. In addition, one ant can sting several times without letting go with its mandibles.

Once stung, humans experience a sharp pain that lasts a couple of minutes, then after a while the sting starts itching and a welt appears. Fire ant venom contains alkaloids and a relatively small amount of protein. The alkaloids kill skin cells; this attracts white blood cells, which form a pustule within a few hours of being stung. The fluid in the pustule is sterile, but if the pustule is broken, the wound may become infected. The protein in the venom can cause allergic reactions that may require medical attention.

Some of the factors related to stinging insects that increase the risk associated with accidental contact are:

- The nests for these insects are frequently found in remote wooded or grassy areas and hidden in cavities
- The nests can be situated in trees, rocks, bushes or in the ground, and are usually difficult to see
- Accidental contact with these insects is highly probable, especially during warm weather conditions when the insects are most active
- If a site worker accidentally disturbs a nest, the worker may be inflicted with multiple stings, causing extreme pain and swelling which can leave the worker incapacitated and in need of medical attention
- Some people are hypersensitive to the toxins injected by a sting, and when stung, experience a violent and immediate allergic reaction resulting in a life-threatening condition known as anaphylactic shock
- Anaphylactic shock manifests itself very rapidly and is characterized by extreme swelling of the body, eyes, face, mouth and respiratory passages
- The hypersensitivity needed to cause anaphylactic shock, can in some people, accumulate over time and exposure, therefore, even if someone has been stung previously, and not experienced an allergic reaction, there is no guarantee that they will not have an allergic reaction if they are stung again

With these things in mind, and with the high probability of contact with stinging insects, use the following safe work practices:

- If a worker knows that he is hypersensitive to bee, wasp or hornet stings, inform the site Safety officer of this condition prior to participation in site activities
- All site personnel will be watchful for the presence of stinging insects and their nests, and will advise the Site Safety officer if a stinging insect nest is located or suspected in the area
- Any nests located on site will be flagged off and site personnel will be notified of its presence
- If attacked, site personnel will immediately seek shelter and stay there. Do not jump in water (bees will still be in the area when you come up). Once safe, remove stings from your skin, it does not matter how you do it, but do it as quickly as possible to reduce the amount of venom they inject. Obtain first aid treatment and contact the safety officer who will observe for signs of allergic reaction

Treatment for fire ant stings is aimed at preventing secondary bacterial infection, which may occur if the pustule is scratched or broken. Clean the blisters with soap and water to prevent secondary infection. Do not break the blister. Topical corticosteroid ointments and oral antihistamines may relieve the itching associated with these reactions.

Site personnel with a known hypersensitivity to stinging insects will keep required emergency medication on or near their person at all times

Spiders

A large variety of spiders may be encountered during site activities. Extreme caution must be used when lifting logs and debris, since spiders are typically found in these areas.

While most spider bites merely cause localized pain, swelling, reddening, and in some cases, tissue damage, there are a few spiders that, due to the severity of the physiological affects caused by their venom, are dangerous. The UXOSO will brief site personnel as to the identification and avoidance of these dangerous spiders. These species include the black widow and the brown or violin spiders.

The black widow is a coal-black bulbous spider 3/4 to 1 1/2 inches in length, with a bright red hourglass on the under side of the abdomen. The black widow is usually found in dark moist locations, especially under rocks, rotting logs and may even be found in outdoor toilets where they inhabit the underside of the seat. Victims of a black widow bite may exhibit the following signs or symptoms:

- Sensation of pinprick or minor burning at the time of the bite
- Appearance of small punctures (but sometimes none are visible)
- After 15 to 60 minutes, intense pain is felt at the site of the bite which spreads quickly, and is followed by profuse sweating, rigid abdominal muscles, muscle spasms, breathing difficulty, slurred speech, poor coordination, dilated pupils and generalized swelling of face and extremities

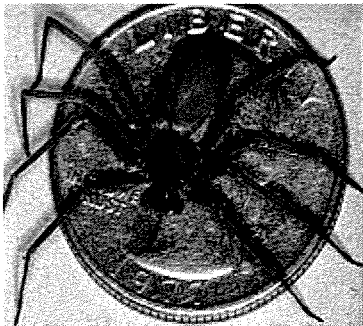
The brown or violin spider is brownish to tan in color, rather flat, 1/2 to 5/8 Spider inches long. However, unlike the typical species, the ones encountered at the former Fort Ord do not have a violin or "fiddle" shaped mark on the top of the head. Of the brown spider, there are three varieties found in the United States that present a problem to site personnel. These are the brown recluse, the desert violin and the

Arizona violin. These spiders may be found in a variety of locations including trees, rocks or in dark locations. Victims of a brown or violin spider bite may exhibit the following signs or symptoms:

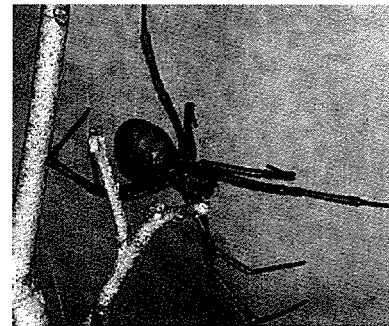
- Blistering at the site of the bite, followed by a local burning at the site 30 to 60 minutes after the bite
- Formation of a large, red, swollen, postulating lesion with a bull's-eye appearance
- Systemic affects may include a generalized rash, joint pain, chills, fever, nausea and vomiting
- Pain may become severe after 8 hours, with the onset of tissue necrosis

There is no effective first aid treatment for either of these bites. Except for very young, very old or weak victims, spider bites are not considered to be life threatening. However, medical treatment must be sought to reduce the extent of damage caused by the injected toxins.

Brown Recluse Spider



Black Widow Spider



First aid should include:

- If possible, catch the spider to confirm its identity. Even if the body is crushed, save it for identification
- Clean the bitten area with soap and water or rubbing alcohol
- To relieve pain, place an ice pack over the bite
- Keep the victim quiet and monitor breathing

Seek immediate medical attention

Sensitivity Reaction to Insect Stings or Bites

A sensitivity reaction is one of the more dangerous and acute effects of insect bites or stings. It is the most common cause of fatalities from bites, particularly from bees, wasps, and spiders. Anaphylactic shock due to stings can lead to severe reactions in the circulatory, respiratory, and central nervous system. This can also result in death.

Site personnel must be questioned regarding their allergic reaction to insect bites. Anyone knowingly allergic should be required to carry and know how to use a response kit. First aid providers must be instructed on how to use the kit also. The kit must be inspected to ensure it is updated.

Administer first aid and observe persons reporting stings for signs of allergic reaction, such as unusual swelling, nausea, dizziness, and shock. At the first sign of these symptoms, take the individual to a medical facility for attention.

Insect Borne Diseases

Diseases that are spread by insects include the following: Rocky Mountain Spotted Fever or Lyme Disease (tick); Bubonic and other forms of Plague (fleas); Malaria, West Nile Virus and Equine Encephalitis (mosquito) and Leshmaniasis (Sand Flies)

Tick Borne Diseases

Lyme disease is the second most rapidly spreading disease in the U.S.

Lyme Disease

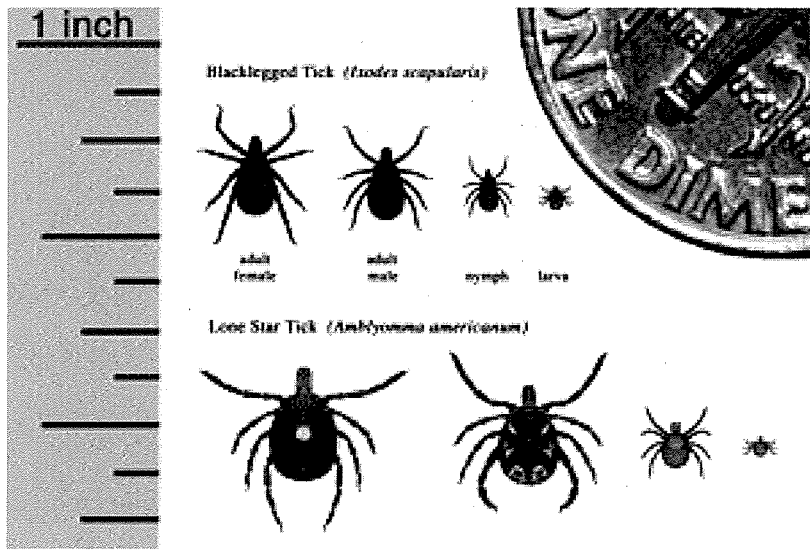
1. Facts

Definition:

- Bacterial infection transmitted by the bite of an infected black-legged tick more popularly known as the deer tick.
- Prevalence (nationwide and other countries).
- Three stages/sizes of deer ticks:
 - Larvae
 - Nymph
 - Adult

Tick season is May through October.

Not all ticks transmit Lyme disease (Black legged or deer tick [upper] compared to the Lone Star tick [lower]).



- Ticks must be attached for several hours before Lyme disease can be transmitted.
- Being bitten by a tick does not mean you will get Lyme disease.

2. Prevention and Protection:

- Wear light-colored, tight-knit clothing.
- Wear long pants and long-sleeved shirts.
- Tuck pant legs into shoes or boots.
- Wear a hat.
- Use insect repellent containing DEET ((follow manufacturer's instructions for use).
- Check yourself daily for ticks after being in grassy, wooded areas.
- Request information from the Health and Safety Medical Section regarding Lyme Disease.

3. If Bitten:

- Remove the tick immediately with fine-tipped tweezers. Grasp the tick as close to the skin as possible. Pull gently but firmly without twisting or crushing the tick.
- Wash your hands and dab the bite with an antiseptic.
- Save the tick in a jar in some alcohol. Label the jar with the date of the bite, the area where you picked up the tick and the spot on your body where you were bitten.

- Monitor the bite for any signs of infection or rash.

4. Symptoms:

Early Signs (may vary from person to person)

- Expanding skin rash.
- Flu-like symptoms during summer or early fall that include the following:
 - Chills, fever, headache, swollen lymph nodes.
 - Stiff neck, aching joints, and muscles.
 - Fatigue.
- Later signs
 - Nervous system problems.
 - Heart problems.
 - Arthritis, especially in knees.

5. Upon Onset of Symptoms:

- Notify your Safety Officer (SO) and your supervisor.

Rocky Mountain Spotted Fever

The Center for Disease Control (CDC) has noted the increase of Rocky Mountain Spotted Fever (RMSF) which is caused by bites from infected ticks that live in and near wooded areas, tall grass and brush.

RMSF has occurred in 36 states, with the heaviest concentrations in Oklahoma, North Carolina, South Carolina, and Virginia. Rocky Mountain spotted fever is the most severe and most frequently reported rickettsial illness in the United States. It also occurs in Mexico, and in Central and South America. It is caused by Rocky Mountain Wood Ticks and Dog Ticks that have become infected with rickettsia. Both are black in color.

The disease is caused by *Rickettsia rickettsii*, a species of bacteria that is spread to humans by ixodid (hard) ticks.

Initial signs and symptoms of the disease include sudden onset of fever, headache, and muscle pain, followed by development of rash. The disease can be difficult to diagnose in the early stages, and without prompt and appropriate treatment it can be fatal.

Prevention procedures are the same as for Lyme disease.

Ehrlichiosis

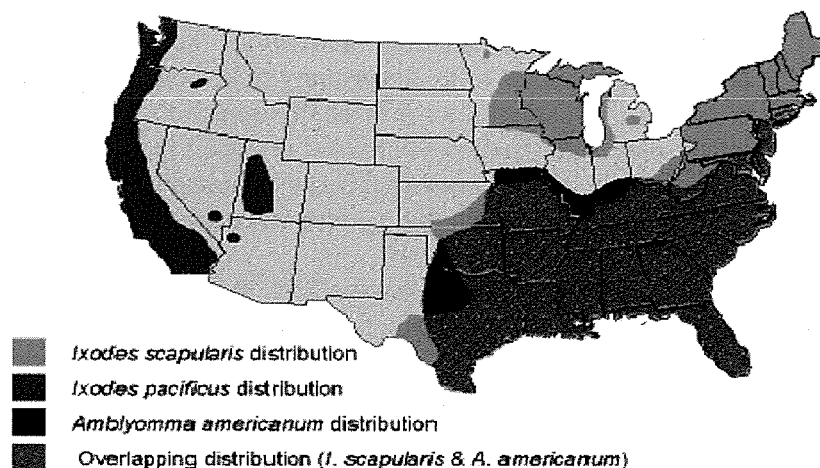
Ehrlichiosis is the general name used to describe several bacterial diseases that affect animals and humans. These diseases are caused by the organisms in the genus *Ehrlichia*. Worldwide, there are currently four ehrlichial species that are known to cause disease in humans.

In the United States, ehrlichiae are transmitted by the bite of an infected tick. The lone star tick (*Amblyomma americanum*), the blacklegged tick (*Ixodes scapularis*), and the western blacklegged tick (*Ixodes pacificus*) are known vectors of ehrlichiosis in the United States. *Ixodes ricinus* is the primary vector in Europe.

The symptoms of ehrlichiosis may resemble symptoms of various other infectious and non-infectious diseases. These clinical features generally include fever, headache, fatigue, and muscle aches. Other signs and symptoms may include nausea, vomiting, diarrhea, cough, joint pains, confusion, and occasionally rash. Symptoms typically appear after an incubation period of 5-10 days following the tick bite. It is possible that many individuals who become infected with ehrlichiae do not become ill or they develop only very mild symptoms.

Most cases of ehrlichiosis are reported within the geographic distribution of the vector ticks (see map below). Occasionally, cases are reported from areas outside the distribution of the tick vector. In most instances, these cases have involved persons who traveled to areas where the diseases are endemic, and who had been bitten by an infected tick and developed symptoms after returning home. Therefore, if you traveled to an ehrlichiosis-endemic area 2 weeks prior to becoming ill, you should tell your doctor where you traveled.

Figure 20. Areas where human ehrlichiosis may occur based on approximate distribution of vector tick species



A diagnosis of ehrlichiosis is based on a combination of clinical signs and symptoms and confirmatory laboratory tests. Blood samples can be sent to a reference laboratory for testing. However, the availability of the different types of laboratory tests varies considerably. Other laboratory findings indicative of ehrlichiosis include low white blood cell count, low platelet count, and elevated liver enzymes.

Ehrlichiosis is treated with a tetracycline antibiotic, usually doxycycline.

Very little is known about immunity to ehrlichial infections. Although it has been proposed that infection with ehrlichiae confers long-term protection against reinfection, there have been occasional reports of laboratory-confirmed reinfection. Short-term protection has been described in animals infected with some *Ehrlichia* species and this protection wanes after about 1 year. Clearly, more studies are needed to determine the extent and duration of protection against reinfection in humans.

Limiting exposure to ticks reduces the likelihood of infection in persons exposed to tick-infested habitats. Prompt careful inspection of your body and removal of crawling or attached ticks is an important method of preventing disease. It may take 24–48 hours of attachment before microorganisms are transmitted from the tick to you.

Preventive measures - Follow protection protocols for Lyme disease

Babesiosis

Babesiosis is an intraerythrocytic parasitic infection caused by protozoa of the genus *Babesia* and transmitted through the bite of the *Ixodes* tick, the same vector responsible for transmission of Lyme disease. While most cases are tick-borne, transfusion and transplacental transmission have been reported. In the United States, babesiosis is usually an asymptomatic infection in healthy individuals. Several groups of patients become symptomatic, and, within these subpopulations, significant morbidity and mortality occur. The disease most severely affects patients who are elderly, immunocompromised, or asplenic. Among those symptomatically infected, the mortality rate is 10% in the United States and 50% in Europe.

The primary vectors of the parasite are ticks of the genus *Ixodes*. In the United States, the black-legged tick, *Ixodes scapularis* (also known as *Ixodes dammini*) is the primary vector for the parasite; in Europe, *Ixodes ricinus* appears to be the primary tick vector. In each location, the *Ixodes* tick vector for *Babesia* is the same vector that locally transmits *Borrelia burgdorferi*, the agent implicated in Lyme disease. The primary US animal reservoir is the white-footed mouse, *Peromyscus leucopus*. Additionally, white-tailed deer serve as transport hosts for the adult tick vector, *I. scapularis*. In Europe, the primary animal reservoir is cattle.

The Ixodid ticks ingest *Babesia* during feeding from the host, multiply the protozoa in their gut wall, and concentrate it in their salivary glands. The tick inoculates a new host when feeding again. The parasite then infects red blood cells (RBCs) and differentiated and undifferentiated trophozoites are produced. The former produce 2-4 merozoites that disrupt the RBC and go on to invade other RBCs. This leads to hemolytic anemia, thrombocytopenia, and atypical lymphocyte formation. Alterations in RBC membranes cause decreased conformability and increased red cell adherence, which can lead to development of acute respiratory distress syndrome (ARDS) among those severely affected.

The first US case of babesiosis was reported on Nantucket Island in 1966. An increasing trend over the past 30 years may be the result of restocking of the deer population, curtailment of hunting, and an increase in outdoor recreational activities. Between 1968 and 1993, more than 450 cases of *Babesia* infections were confirmed in the United States. However, the actual prevalence of this disease is unknown because most infected patients are asymptomatic.

The first case of human babesiosis was reported in 1957 from the former Yugoslavia in an asplenic farmer. Approximately 40 cases have been reported since then, mostly in Ireland, the United Kingdom, and France. Sporadic case reports of babesiosis in Japan, Korea, China, Mexico, South Africa, and Egypt have also been documented.

The signs and symptoms mimic malaria and range in severity from asymptomatic to septic shock.

Symptoms include: Generalized weakness, fatigue, depression, fever, anorexia and weight loss, CNS - Headache, photophobia, neck stiffness, altered sensorium, pulmonary - Cough, shortness of breath, GI - Nausea, vomiting, abdominal pain, Musculoskeletal - Arthralgia and myalgia and Renal - Dark urine

Prevention

Prevention measures are the same as for Lyme and other insect borne diseases

Tularemia

Tularemia (also known as "rabbit fever") is a serious infectious disease caused by the bacterium *Francisella tularensis*. The disease is endemic in North America, and parts of Europe and Asia. The primary vectors are ticks and deer flies, but the disease can also be spread through other arthropods. Animals such as rabbits, prairie dogs, hares and muskrats serve as reservoir hosts. The disease is named after Tulare County, California.

Depending on the site of infection, tularemia has six characteristic clinical syndromes: ulceroglandular, glandular, oropharyngeal, pneumonic, oculoglandular, and typhoidal.

The disease has a very rapid onset, with headache, fatigue, dizziness, muscle pains, loss of appetite and nausea. Face and eyes redden and become inflamed. Inflammation spreads to the lymph nodes, which enlarge and may suppurate (mimicking bubonic plague). Lymph node involvement is accompanied by a high fever. Death may result.

Francisella tularensis is one of the most infective bacteria known; fewer than ten organisms can cause disease leading to severe illness. The bacteria penetrate into the body through damaged skin and mucous membranes, or through inhalation. Humans are most often infected by tick bite or through handling an infected animal. Ingesting infected water, soil, or food can also cause infection. Tularemia can also be acquired by inhalation; hunters are at a higher risk for this

disease because of the potential of inhaling the bacteria during the skinning process. Tularemia is not spread directly from person to person.

No vaccine is available to the general public. The best way to prevent tularemia infection is to wear rubber gloves when handling or skinning rodents or lagomorphs (as rabbits), avoid ingesting uncooked wild game and untreated water sources, and wearing long-sleeved clothes and using an insect repellent to prevent tick bites.

Prevention

No vaccine is available to the general public. The best way to prevent tularemia infection is to wear rubber gloves when handling or skinning rodents or lagomorphs (as rabbits), avoid ingesting uncooked wild game and untreated water sources, and wearing long-sleeved clothes and using an insect repellent to prevent tick bites.

Flea Borne Diseases

Plague

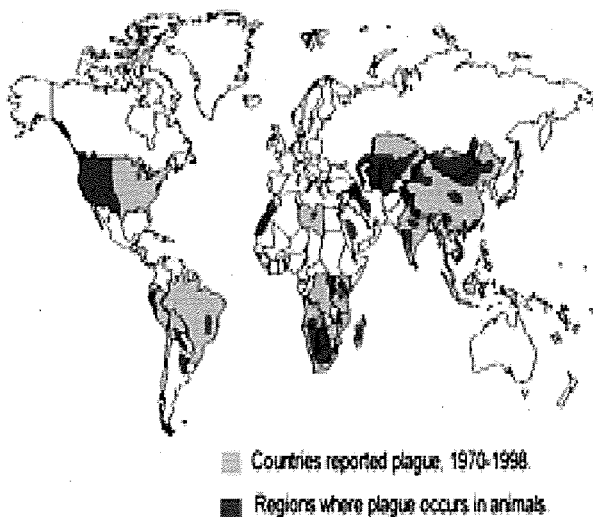
- **Bubonic plague:** enlarged, tender lymph nodes, fever, chills and prostration
- **Septicemic plague:** fever, chills, prostration, abdominal pain, shock and bleeding into skin and other organs
- **Pneumonic plague:** fever, chills, cough and difficulty breathing; rapid shock and death if not treated early

Introduction: Plague is an infectious disease of animals and humans caused by a bacterium named *Yersinia pestis*.

People usually get plague from being bitten by a rodent flea that is carrying the plague bacterium or by handling an infected animal. Millions of people in Europe died from plague in the Middle Ages, when human homes and places of work were inhabited by flea-infested rats. Today,

modern antibiotics are effective against plague, but if an infected person is not treated promptly, the disease is likely to cause illness or death.

World Distribution of Plague, 1998



Risk: Wild rodents in certain areas around the world are infected with plague. Outbreaks in people still occur in rural communities or in cities. They are usually associated with infected rats and rat fleas that live in the home. In the United States, the last urban plague epidemic occurred in Los Angeles in 1924-25. Since then, human plague in the United States has occurred as mostly scattered cases in rural areas (an average of 10 to 15 persons each year). Globally, the

World Health Organization reports 1,000 to 3,000 cases of plague every year. In North America, plague is found in certain animals and their fleas from the Pacific Coast to the Great Plains, and from southwestern Canada to Mexico. Most human cases in the United States occur in two regions: 1) northern New Mexico, northern Arizona, and southern Colorado; and 2) California, southern Oregon, and far western Nevada. Plague also exists in Africa, Asia, and South America (see map).

Diagnosis: The typical sign of the most common form of human plague is a swollen and very tender lymph gland, accompanied by pain. The swollen gland is called a "bubo." Bubonic plague should be suspected when a person develops a swollen gland, fever, chills, headache, and extreme exhaustion, and has a history of possible exposure to infected rodents, rabbits, or fleas.

A person usually becomes ill with bubonic plague 2 to 6 days after being infected. When bubonic plague is left untreated, plague bacteria invade the bloodstream. As the plague bacteria multiply in the bloodstream, they spread rapidly throughout the body and cause a severe and often fatal condition. Infection of the lungs with the plague bacterium causes the pneumonic form of plague, a severe respiratory illness. The infected person may experience high fever, chills, cough, and breathing difficulty and may expel bloody sputum. If plague patients are not given specific antibiotic therapy, the disease can progress rapidly to death. About 14% (1 in 7) of all plague cases in the United States are fatal.

Prevention and Control

Risk reduction: Attempts to eliminate fleas and wild rodents from the natural environment in plague-infected areas are impractical. However, controlling rodents and their fleas around places where people live, work, and play is very important in preventing human disease. Therefore, preventive measures are directed to home, work, and recreational settings where the risk of acquiring plague is high. A combined approach using the following methods is recommended: environmental sanitation educating the public on ways to prevent plague exposures preventive antibiotic therapy

Environmental Sanitation: Effective environmental sanitation reduces the risk of persons being bitten by infectious fleas of rodents and other animals in places where people live, work, and recreate. It is important to remove food sources used by rodents and make homes, buildings, warehouses, or feed sheds rodent-proof. Applying chemicals that kill fleas and rodents is effective but should usually be done by trained professionals. Rats that inhabit ships and docks should also be controlled by trained professionals who can inspect and, if necessary, fumigate cargoes.

Public Health Education: In the western United States, where plague is widespread in wild rodents, people living, working, or playing where the infection is active face the greatest threat. Educating the general public and the medical community about how to avoid exposure to disease-bearing animals and their fleas is very important and should include the following preventive recommendations:

- Watch for plague activity in rodent populations where plague is known to occur. Report any observations of sick or dead animals to the local health department or law enforcement officials.
- Eliminate sources of food and nesting places for rodents around homes, work places, and recreation areas; remove brush, rock piles, junk, cluttered firewood, and potential-food supplies, such as pet and wild animal food. Make your home rodent-proof.
- If you anticipate being exposed to rodent fleas, apply insect repellents to clothing and skin, according to label instructions, to prevent flea bites. Wear gloves and tyvek coveralls when handling potentially infected animals.
- If you live in areas where rodent plague occurs, treat pet dogs and cats for flea control regularly and not allow these animals to roam freely.
- Health authorities may use appropriate chemicals to kill fleas at selected sites during animal plague outbreaks.

Prophylactic (preventive) antibiotics: Health authorities advise that antibiotics be given for a brief period to people who have been exposed to the bites of potentially infected rodent fleas (for example, during a plague outbreak) or who have handled an animal known to be infected with the plague bacterium. Such experts also recommend that antibiotics be given if a person has had close exposure to a person or an animal (for example, a house cat) with suspected plague pneumonia.

Persons who must be present in an area where a plague outbreak is occurring can protect themselves for 2 to 3 weeks by taking antibiotics. The preferred antibiotics for prophylaxis against plague are the tetracyclines or the sulfonamides.

Other diseases primarily transmitted by Arthropods (Ticks, mites, lice etc.)

Rickettsial Infections

Description

Many species of *Rickettsia* can cause illnesses in humans (Table below). The term “rickettsiae” conventionally embraces a polyphyletic group of microorganisms in the class Proteobacteria, comprising species belonging to the genera *Rickettsia*, *Orientia*, *Ehrlichia*, *Anaplasma*, *Neorickettsia*, *Coxiella*, and *Bartonella*. These agents are usually not transmissible directly from person to person except by blood transfusion or organ transplantation, although sexual and placental transmission has been proposed for *Coxiella*. Transmission generally occurs via an infected arthropod vector or through exposure to an infected animal reservoir host.

Some of the diseases transmitted in this manner (Typhus, Rocky Mountain Spotted Fever, Q Fever, Ehrlichiosis) are discussed in detail in this and other Biological Hazard FLDs. A summary of these diseases is included in Attachment 1.

Typhus (Not to be confused with Typhoid Fever [discussed in these FLDs])

For the unrelated disease caused by Salmonella typhi, see Typhoid fever. For the unrelated disease caused by Salmonella paratyphi, please refer to Paratyphoid fever. For the monster of Greek mythology, see Typhus (monster).

Typhus is any one of several similar diseases caused by louse-borne bacteria. The name comes from the Greek *typhos*, meaning smoky or lazy, describing the state of mind of those affected with typhus. *Rickettsia* is endemic in rodent hosts, including mice and rats, and spreads to humans through mites, fleas and body lice. The arthropod vector flourishes under conditions of poor hygiene, such as those found in prisons or refugee camps, amongst the homeless, or until the middle of the 20th century, in armies in the field. In tropical countries, typhus is often mistaken for dengue fever

Epidemic typhus

Epidemic typhus (also called "Jail Fever", "Hospital Fever", "Ship fever", "Famine fever", "Petechial Fever", and "louse-borne typhus") is so named because the disease often causes epidemics following wars and natural disasters. The causative organism is *Rickettsia prowazekii*, transmitted by the human body louse (*Pediculus humanus corporis*). Feeding on a human who carries the bacillus infects the louse. *R. prowazekii* grows in the louse's gut and is excreted in its feces. The disease is then transmitted to an uninfected human who scratches the louse bite (which itches) and rubs the feces into the wound. The incubation period is one to two weeks. *R. prowazekii* can remain viable and virulent in the dried louse feces for many days. Typhus will eventually kill the louse, though the disease will remain viable for many weeks in the dead louse.

The symptoms set in quickly, and are among the most severe of the typhus family. They include severe headache, a sustained high fever, cough, rash, severe muscle pain, chills, falling blood pressure, stupor, sensitivity to light, and delirium. A rash begins on the chest about five days after the fever appears, and spreads to the trunk and extremities but does not reach the palms and soles. A symptom common to all forms of typhus is a fever which may reach 39°C (102°F).

The infection is treated with antibiotics. Intravenous fluids and oxygen may be needed to stabilize the patient. The mortality rate is 10% to 60%, but is vastly lower if antibiotics such as tetracycline are used early. Infection can also be prevented via vaccination. Brill-Zinsser disease is a mild form of epidemic typhus which recurs in someone after a long period of latency (similar to the relationship between chickenpox and shingles). This type of recurrence can also occur in immunosuppressed patients.

Endemic typhu

Endemic typhus (also called "flea-borne typhus" and "murine typhus" or "rat flea typhus") is caused by the bacteria *Rickettsia typhi*, and is transmitted by the fleas that infest rats. Less often, endemic typhus is caused by *Rickettsia felis* and transmitted by fleas carried by cats or possums.

Symptoms of endemic typhus include headache, fever, chills, myalgia, nausea, vomiting, and cough.

Endemic typhus is highly treatable with antibiotics. Most people recover fully, but death may occur in the elderly, severely disabled or patients with a depressed immune system.

Scrub typhus

Scrub typhus (also called "chigger-borne typhus") is caused by *Orientia tsutsugamushi* and transmitted by chiggers, which are found in areas of heavy scrub vegetation. Symptoms include fever, headache, muscle pain, cough, and gastrointestinal symptoms. More virulent strains of *O. tsutsugamushi* can cause hemorrhaging and intravascular coagulation.

Prevention

Limiting exposures to vectors or animal reservoirs remains the best means for reducing the risk for disease. Travelers and persons working in areas where organisms may be present should implement prevention based on avoidance of vector-infested habitats, use of repellents and protective clothing, prompt detection and removal of arthropods from clothing and skin, and attention to hygiene.

Typhus fever was categorized by the Center for Disease Control (CDC) as a Category B biological weapons agent. *Rickettsia prowazekii* is highly infectious and could be fatal but cannot be passed from person to person.

Encephalitis Arboviral Encephalitides

Perspectives

Arthropod-borne viruses, i.e., arboviruses, are viruses that are maintained in nature through biological transmission between susceptible vertebrate hosts by blood feeding arthropods (mosquitoes, psychodids, ceratopogonids, and ticks). Vertebrate infection occurs when the infected arthropod takes a blood meal. The term 'arbovirus' has no taxonomic significance. Arboviruses that cause human encephalitis are members of three virus families: the *Togaviridae* (genus *Alphavirus*, *Flaviviridae*, and *Bunyaviridae*).

All arboviral encephalitides are zoonotic, being maintained in complex life cycles involving a nonhuman primary vertebrate host and a primary arthropod vector. These cycles usually remain undetected until humans encroach on a natural focus, or the virus escapes this focus via a secondary vector or vertebrate host as the result of some ecologic change. Humans and domestic animals can develop clinical illness but usually are "dead-end" hosts because they do not produce significant viremia, and do not contribute to the transmission cycle. Many arboviruses that cause encephalitis have a variety of different vertebrate hosts and some are transmitted by more than one vector. Maintenance of the viruses in nature may be facilitated by vertical transmission (e.g., the virus is transmitted from the female through the eggs to the offspring).

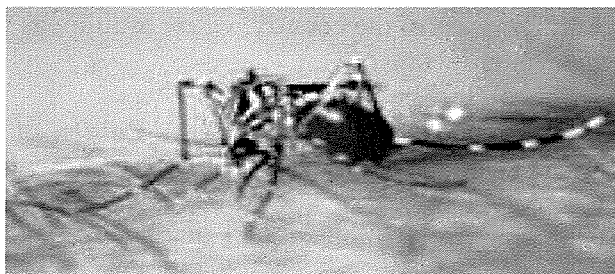
Arboviral encephalitides have a global distribution, but there are four main virus agents of encephalitis in the United States: eastern equine encephalitis (EEE), western equine encephalitis (WEE), St. Louis encephalitis (SLE) and La Crosse (LAC) encephalitis, all of which are transmitted by mosquitoes. Another virus, Powassan, is a minor cause of encephalitis in the northern United States, and is transmitted by ticks. A new Powassan-like virus has recently been isolated from deer ticks. Its relatedness to Powassan virus and its ability to cause disease has not been well documented. Most cases of arboviral encephalitis occur from June through September, when arthropods are most active. In milder (i.e., warmer) parts of the country, where arthropods are active late into the year, cases can occur into the winter months.

There is expanded discussion of several of these diseases (West Nile and Eastern Equine Encephalitis elsewhere in this document. A more general discussion is found in Attachment 2.

Mosquito Borne Diseases

Malaria

Malaria is a mosquito-borne disease caused by a parasite. Four kinds of malaria parasites can infect humans: *Plasmodium falciparum*, *P. vivax*, *P. ovale*, and *P. malariae*.



People with malaria often experience fever, chills, and flu-like illness. Left untreated, they may develop severe complications and die. Each year 350-500 million cases of malaria occur worldwide, and over one million people die, most of them young children in sub-Saharan Africa. Infection with any of the malaria species can make a person feel very ill; infection with *P. falciparum*, if not promptly treated, may be fatal. Although malaria can be a fatal disease, illness and death from malaria are largely preventable.

This sometimes fatal disease can be prevented and cured. Bed nets, insecticides, and anti-malarial drugs are effective tools to fight malaria in areas where it is transmitted. Travelers to a malaria-risk area should avoid mosquito bites and take a preventive anti-malarial drug. Malaria was eradicated from the United States in the early 1950s. However, malaria is common in many developing countries and travelers who visit these areas risk getting malaria.

Returning travelers and arriving immigrants could also reintroduce the disease in the United States if they are infected with malaria when they return. The mosquito that transmits malaria, *Anopheles*, is found throughout much of the United States. If local mosquitoes bite an infected person, those mosquitoes can, in turn, infect local residents (*introduced malaria*).

Because the malaria parasite is found in red blood cells, malaria can also be transmitted through blood transfusion, organ transplant, or the shared use of needles or syringes contaminated with blood. Malaria may also be transmitted from a mother to her fetus before or during delivery ("congenital" malaria).

Malaria is not transmitted from person to person like a cold or the flu. You cannot get malaria from casual contact with malaria-infected people.

Prevention and control

You can prevent malaria by:

- keeping mosquitoes from biting you, especially at night
- taking anti-malarial drugs to kill the parasites
- eliminating places where mosquitoes breed
- spraying insecticides on walls to kill adult mosquitoes that come inside
- sleeping under bed nets - especially effective if they have been treated with insecticide,
- wearing insect repellent and long-sleeved clothing if out of doors at night

The surest way for you and your health-care provider to know whether you have malaria is to have a diagnostic test where a drop of your blood is examined under the microscope for the presence of malaria parasites. If you are sick and there is any suspicion of malaria (for example, if you have recently traveled in a malaria-risk area) the test should be performed without delay.

The disease should be treated early in its course, before it becomes severe and poses a risk to the patient's life. Several good anti-malarial drugs are available, and should be administered early on. The most important step is to think about malaria, so that the disease is diagnosed and treated in time.

West Nile Virus

West Nile virus (WNV) is a potentially serious illness. Experts believe WNV is established as a seasonal epidemic in North America that flares up in the summer and continues into the fall. This fact sheet contains important information that can help you recognize and prevent WNV.

The easiest and best way to avoid WNV is to prevent mosquito bites.

- When you are outdoors, use insect repellent containing an EPA-registered active ingredient. Follow the directions on the package.
- Many mosquitoes are most active at dusk and dawn. Be sure to use insect repellent and wear long sleeves and pants at these times or consider staying indoors during these hours.
- Make sure you have good screens on your windows and doors to keep mosquitoes out.
- Get rid of mosquito breeding sites by emptying standing water from buckets, barrels and drainage ditches.

About one in 150 people infected with WNV will develop severe illness. The severe symptoms can include high fever, headache, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, vision loss, numbness and paralysis. These symptoms may last several weeks, and neurological effects may be permanent.

Up to 20 percent of the people who become infected have symptoms such as fever, headache, and body aches, nausea, vomiting, and sometimes swollen lymph glands or a skin rash on the

chest, stomach and back. Symptoms can last for as short as a few days, though even healthy people have become sick for several weeks.

Approximately 80 percent of people (about 4 out of 5) who are infected with WNV will not show any symptoms at all.

Most often, WNV is spread by the bite of an infected mosquito. Mosquitoes become infected when they feed on infected birds. Infected mosquitoes can then spread WNV to humans and other animals when they bite.

In a very small number of cases, WNV also has been spread through blood transfusions, organ transplants, breastfeeding and even during pregnancy from mother to baby.

WNV is not spread through casual contact such as touching or kissing a person with the virus.

Symptoms typically develop between 3 - 14 days after being bitten by an infected mosquito.

There is no specific treatment for WNV infection. In cases with milder symptoms, people experience symptoms such as fever and aches that pass on their own, although even healthy people have become sick for several weeks. In more severe cases, people usually need to go to the hospital where they can receive supportive treatment including intravenous fluids, help with breathing and nursing care.

Milder WNV illness improves on its own, and people do not necessarily need to seek medical attention for this infection though they may choose to do so. If you develop symptoms of severe WNV illness, such as unusually severe headaches or confusion, seek medical attention immediately. Severe WNV illness usually requires hospitalization. Pregnant women and nursing mothers are encouraged to talk to their doctor if they develop symptoms that could be WNV. People over the age of 50 are more likely to develop serious symptoms of WNV if they do get sick and should take special care to avoid mosquito bites.

The more time you're outdoors, the more time you could be bitten by an infected mosquito. Pay attention to avoiding mosquito bites if you spend a lot of time outside, either working or playing.

All donated blood is checked for WNV before being used. The risk of getting WNV through blood transfusions and organ transplants is very small, and should not prevent people who need surgery from having it. If you have concerns, talk to your doctor.

Equine Encephalitis

Eastern equine encephalitis (EEE) is a mosquito-borne viral disease. EEE virus (EEEV) occurs in the eastern half of the United States where it causes disease in humans, horses, and some bird species. Because of the high mortality rate, EEE is regarded as one of the most serious mosquito-borne diseases in the United States.

EEEV is transmitted to humans through the bite of an infected mosquito. It generally takes from

3 to 10 days to develop symptoms of EEE after being bitten by an infected mosquito. The main EEEV transmission cycle is between birds and mosquitoes.

Many species of mosquitoes can become infected with EEEV. The most important mosquito species in maintaining the bird-mosquito transmission cycle is *Culiseta melanura*, which reproduces in freshwater hardwood swamps. *Culiseta melanura*, however, is not considered to be an important vector of EEEV to horses or humans because it feeds almost exclusively on birds.

Transmission to horses or humans requires mosquito species capable of creating a “bridge” between infected birds and uninfected mammals such as some *Aedes*, *Coquillettidia*, and *Culex* species.

Horses are susceptible to EEE and some cases are fatal. EEEV infections in horses, however, are not a significant risk factor for human infection because horses are considered to be “dead-end” hosts for the virus (i.e., the amount of EEEV in their bloodstreams is usually insufficient to infect mosquitoes).

Eastern equine encephalitis virus is a member of the family Togaviridae, genus *Alphavirus* closely related to Western equine encephalitis virus and Venezuelan equine encephalitis virus

Many persons infected with EEEV have no apparent illness. In those persons who do develop illness, symptoms range from mild flu-like illness to inflammation of the brain, coma and death.

The mortality rate from EEE is approximately one-third, making it one of the most deadly mosquito-borne diseases in the United States.

There is no specific treatment for EEE; optimal medical care includes hospitalization and supportive care (for example, expert nursing care, respiratory support, prevention of secondary bacterial infections, and physical therapy, depending on the situation).

Approximately half of those persons who survive EEE will have mild to severe permanent neurologic damage.

Incidence rate includes:

- Approximately 220 confirmed cases in the US 1964-2004, Average of 5 cases/year, with a range from 0-15 cases
- States with largest number of cases are Florida, Georgia, Massachusetts, and New Jersey.
- EEEV transmission is most common in and around freshwater hardwood swamps in the Atlantic and Gulf Coast states and the Great Lakes region.
- Human cases occur relatively infrequently, largely because the primary transmission cycle takes place in and around swampy areas where human populations tend to be limited.

Risk Groups:

- Residents of and visitors to endemic areas (areas with an established presence of the virus)
- People who engage in outdoor work and recreational activities in endemic areas.
- Persons over age 50 and younger than age 15 seem to be at greatest risk for developing severe EEE when infected with the virus.

Prevention

- A vaccine is available to protect equines.
- People should avoid mosquito bites by employing personal and workplace protection measures, such as using an EPA-registered repellent according to manufacturers' instructions, wearing protective clothing, avoiding outdoor activity when mosquitoes are active (some bridge vectors of EEEV are aggressive day-biters), and removing standing water that can provide mosquito breeding sites.
- There are laboratory tests to diagnosis EEEV infection including serology, especially IgM testing of serum and cerebrospinal fluid (CSF), and neutralizing antibody testing of acute- and convalescent-phase serum.

Yellow Fever

Yellow fever is an acute viral disease. It is an important cause of hemorrhagic illness in many African and South American countries despite existence of an effective vaccine. The *yellow* refers to the jaundice symptoms that affect some patients.

Yellow fever is caused by an arbovirus of the family Flaviviridae, a positive single-stranded RNA virus. Human infection begins after deposition of viral particles through the skin in infected arthropod saliva. The mosquitoes involved are *Aedes simpsoni*, *A. africanus*, and *A. aegypti* in Africa, the *Haemagogus* genus in South America.

The virus remains silent in the body during an incubation period of three to six days. There are then two disease phases. While some infections have no symptoms the first, *acute* phase is normally characterized by fever, muscle pain (with prominent backache), headache, shivers, loss of appetite, and nausea or vomiting. The high fever is often paradoxically associated with a slow pulse (known as Faget's sign). After three or four days most patients improve and their symptoms disappear.

Fifteen percent of patients, however, enter a *toxic phase* within 24 hours. Fever reappears and several body systems are affected. The patient rapidly develops jaundice and complains of abdominal pain with vomiting. Bleeding can occur from the mouth, nose, eyes, and stomach. Once this happens, blood appears in the vomit and feces. Kidney function deteriorates; this can range from abnormal protein levels in the urine (proteinuria) to complete kidney failure with no

urine production (anuria). Half of the patients in the "toxic phase" die within fourteen days. The remainder recover without significant organ damage.

Yellow fever is difficult to recognize, especially during the early stages. It can easily be confused with malaria, typhoid, rickettsial diseases, haemorrhagic viral fevers (e.g. Lassa), arboviral infections (e.g. dengue), leptospirosis, viral hepatitis and poisoning (e.g. carbon tetrachloride). A laboratory analysis is required to confirm a suspect case.

Prevention

There is a vaccine for yellow fever that gives a ten-year or more immunity from the disease and effectively protects people traveling to affected areas. The vaccination may be required for entry to some countries, however, the vaccine may be contra-indicated for person over 60 years of age.

Use precautions as for other mosquito borne diseases. Avoid mosquito bites by employing personal and workplace protection measures, such as using an EPA-registered repellent according to manufacturers' instructions, wearing protective clothing, avoiding outdoor activity when mosquitoes are active and removing standing water that can provide mosquito breeding sites.

Meningitis

Meningitis is a viral disease that can affect the central nervous system.

Meningitis is encountered in agricultural regions of Asia.

Meningitis is transmitted through the bite from an infected mosquito.

Symptoms can be nonexistent or severe and flu-like, with fever, chills, tiredness, headache, nausea and vomiting. If not treated promptly the disease can be fatal.

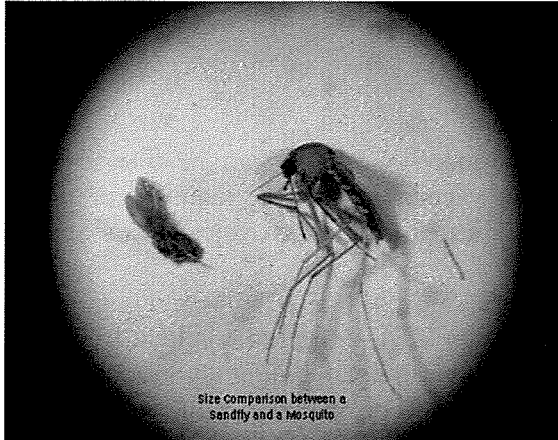
Prevention

- A vaccine is available. It's 80% effective after a single dose and 97.5% effective after a second dose.

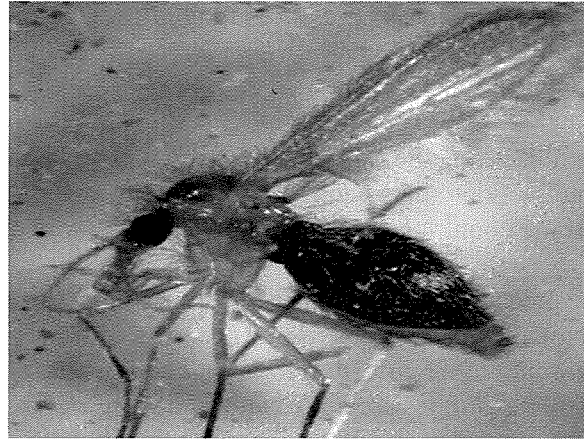
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Sand Flies

Leishmaniasis



Sand Fly and Mosquito



Sand Fly

Leishmaniasis (LEASH-ma-NIGH-a-sis) is a parasitic disease spread by the bite of infected sand flies. There are several different forms of leishmaniasis. The most common forms are **cutaneous leishmaniasis**, which causes skin sores, and **visceral leishmaniasis**, which affects some of the internal organs of the body (for example, spleen, liver, bone marrow).

People who have cutaneous leishmaniasis have one or more sores on their skin. The sores can change in size and appearance over time. They often end up looking somewhat like a volcano, with a raised edge and central crater. Some sores are covered by a scab. The sores can be painless or painful. Some people have swollen glands near the sores (for example, under the arm if the sores are on the arm or hand).

People who have visceral leishmaniasis usually have fever, weight loss, and an enlarged spleen and liver (usually the spleen is bigger than the liver). Some patients have swollen glands. Certain blood tests are abnormal. For example, patients usually have low blood counts, including a low red blood cell count (anemia), low white blood cell count, and low platelet count.

The number of new cases of cutaneous leishmaniasis each year in the world is thought to be about 1.5 million. The number of new cases of visceral leishmaniasis is thought to be about 500,000.

Leishmaniasis is found in parts of about 88 countries. Approximately 350 million people live in these areas. Most of the affected countries are in the tropics and subtropics. The settings in which leishmaniasis is found range from rain forests in Central and South America to deserts in West Asia. More than 90 percent of the world's cases of visceral leishmaniasis are in India, Bangladesh, Nepal, Sudan, and Brazil.

Leishmaniasis is found in some parts of the following areas:

- in Mexico, Central America, and South America -- from northern Argentina to Texas (not in Uruguay, Chile, or Canada)
- southern Europe (leishmaniasis is not common in travelers to southern Europe)
- Asia (not Southeast Asia)
- the Middle East
- Africa (particularly East and North Africa, with some cases elsewhere)

Leishmaniasis is not found in Australia or Oceania (that is, islands in the Pacific, including Melanesia, Micronesia, and Polynesia).

It is possible but very unlikely that you would get leishmaniasis in the United States. Very rarely, people living in Texas have developed skin sores from cutaneous leishmaniasis.

No cases of visceral leishmaniasis are known to have been acquired in the United States.

Leishmaniasis is spread by the bite of some types of phlebotomine sand flies. Sand flies become infected by biting an infected animal (for example, a rodent or dog) or person. Since sand flies do not make noise when they fly, people may not realize they are present. Sand flies are very small and may be hard to see; they are only about one-third the size of typical mosquitoes. Sand flies usually are most active in twilight, evening, and night-time hours (from dusk to dawn). Sand flies are less active during the hottest time of the day. However, they will bite if they are disturbed, such as when a person brushes up against the trunk of a tree where sand flies are resting. Rarely, leishmaniasis is spread from a pregnant woman to her baby. Leishmaniasis also can be spread by blood transfusions or contaminated needles.

People of all ages are at risk for leishmaniasis if they live or travel where leishmaniasis is found. Leishmaniasis usually is more common in rural than urban areas; but it is found in the outskirts of some cities. The risk for leishmaniasis is highest from dusk to dawn because this is when sand flies are the most active. All it takes to get infected is to be bitten by one infected sand fly. This is more likely to happen the more people are bitten, that is, the more time they spend outside in rural areas from dusk to dawn.

People with cutaneous leishmaniasis usually develop skin sores within a few weeks (sometimes as long as months) of when they were bitten.

People with visceral leishmaniasis usually become sick within several months (rarely as long as years) of when they were bitten.

The skin sores of cutaneous leishmaniasis will heal on their own, but this can take months or even years. The sores can leave ugly scars. If not treated, infection that started in the skin rarely spreads to the nose or mouth and causes sores there (**mucosal leishmaniasis**). This can happen with some of the types of the parasite found in Central and South America. Mucosal leishmaniasis might not be noticed until years after the original skin sores healed. The best way to prevent mucosal leishmaniasis is to treat the cutaneous infection before it spreads.

If not treated, visceral leishmaniasis can cause death. It is very rare for travelers to get visceral leishmaniasis.

If you think you might have leishmaniasis, report to your Safety Officer to ensure appropriate follow-up. The first step is to find out if you have traveled to a part of the world where leishmaniasis is found. The health care provider will ask you about any signs or symptoms of leishmaniasis you may have, such as skin sores that have not healed. If you have skin sores, the health care provider will likely want to take some samples directly from the sores. These samples can be examined for the parasite under a microscope, in cultures, and through other means. A blood test for detecting antibody (immune response) to the parasite can be helpful, particularly for cases of visceral leishmaniasis. However, tests to look for the parasite itself should also be done. Diagnosing leishmaniasis can be difficult. Sometimes the laboratory tests are negative even if a person has leishmaniasis.

The health care provider can talk with CDC staff about whether a case of leishmaniasis should be treated, and, if so, how. Most people who have cutaneous leishmaniasis do not need to be hospitalized during their treatment.

Prevention

The best way prevent leishmaniasis is by protecting against sand fly bites. Vaccines and drugs for preventing infection are not yet available. To decrease risk of being bitten:

- Stay in well-screened or air-conditioned areas as much as possible. Avoid outdoor activities, especially from dusk to dawn, when sand flies are the most active.
- When outside, wear long-sleeved shirts, long pants, and socks. Tuck your shirt into your pants.
- Apply insect repellent on uncovered skin and under the ends of sleeves and pant legs. Follow the instructions on the label of the repellent. The most effective repellents are those that contain the chemical DEET (N,N-diethylmetatoluamide). The concentration of DEET varies among repellents. Repellents with DEET concentrations of 30-35% are quite effective, and the effect should last about 4 hours. Lower concentrations should be used for children (no more than 10% DEET). Repellents with DEET should be used sparingly on children from 2 to 6 years old and not at all on children less than 2 years old.
- Spray clothing with permethrin-containing insecticides. The insecticide should be reapplied after every five washings.
- Spray living and sleeping areas with an insecticide to kill insects.
- If you are not sleeping in an area that is well screened or air-conditioned, use a bed net and tuck it under your mattress. If possible, use a bed net that has been soaked in or sprayed with permethrin. The permethrin will be effective for several months if the bed net is not washed. Keep in mind that sand flies are much smaller than mosquitoes and therefore can get through

smaller holes. Fine-mesh netting (at least 18 holes to the inch; some sources say even finer) is needed for an effective barrier against sand flies. This is particularly important if the bed net has not been treated with permethrin. However, it may be uncomfortable to sleep under such a closely woven bed net when it is hot.

NOTE: Bed nets, repellents containing DEET, and permethrin may need to be purchased before traveling and can be found in hardware, camping, and military surplus stores.

Deer Flies (See Tularemia above)

ATTACHMENT 1

RICKETTSIAL INFECTIONS

Rickettsial Infections

Description

Many species of *Rickettsia* can cause illnesses in humans (Table below). The term “rickettsiae” conventionally embraces a polyphyletic group of microorganisms in the class Proteobacteria, comprising species belonging to the genera *Rickettsia*, *Orientia*, *Ehrlichia*, *Anaplasma*, *Neorickettsia*, *Coxiella*, and *Bartonella*. These agents are usually not transmissible directly from person to person except by blood transfusion or organ transplantation, although sexual and placental transmission has been proposed for *Coxiella*. Transmission generally occurs via an infected arthropod vector or through exposure to an infected animal reservoir host. However, sennetsu fever is acquired following consumption of raw fish products. The clinical severity and duration of illnesses associated with different rickettsial infections vary considerably, even within a given antigenic group. Rickettsioses range in severity from diseases that are usually relatively mild (rickettsialpox, cat scratch disease, and African tick-bite fever) to those that can be life-threatening (epidemic and murine typhus, Rocky Mountain spotted fever, scrub typhus and Oroya fever), and they vary in duration from those that can be self-limiting to chronic (Q fever and bartonellosis) or recrudescent (Brill-Zinsser disease). Most patients with rickettsial infections recover with timely use of appropriate antibiotic therapy.

Travelers may be at risk for exposure to agents of rickettsial diseases if they engage in occupational or recreational activities which bring them into contact with habitats that support the vectors or animal reservoir species associated with these pathogens.

The geographic distribution and the risks for exposure to rickettsial agents are described below and in the Table below.

Epidemic Typhus and Trench Fever

Epidemic typhus and trench fever, which are caused by *Rickettsia prowazkei* and *Bartonella quintana*, respectively, are transmitted from one person to another by the human body louse. Contemporary outbreaks of both diseases are rare in most developed countries and generally occur only in communities and populations in which body louse infestations are frequent, especially during the colder months when louse-infested clothing is not laundered. Foci of trench fever have also been recognized among homeless populations in urban centers of industrialized countries. Travelers who are not at risk of exposure to body lice or to persons with lice are unlikely to acquire these illnesses. However, health-care workers who care for these patients may be at risk for acquiring louse-borne illnesses through inhalation or inoculation of infectious louse feces into the skin or conjunctiva. In the eastern United States, campers, inhabitants of wooded areas, and wildlife workers can acquire sylvatic epidemic typhus if they come in close contact with flying squirrels, their ectoparasites, or their nests, which can be made in houses, cabins, and tree-holes.

Murine Typhus and Cat-Flea Rickettsiosis

Murine typhus, which is caused by infection with *Rickettsia typhi*, is transmitted to humans by rat fleas, particularly during exposure in rat-infested buildings (3). Flea-infested rats can be found throughout the year in humid tropical environments, especially in harbor or riverine environments. In temperate regions, they are most common during the warm summer months. Similarly, cat-flea rickettsiosis, which is caused by infection with *Rickettsia felis*, occurs worldwide from exposure to flea-infested domestic cats and dogs, as well as peridomestic animals, and is responsible for a murine typhus-like febrile disease in humans.

Scrub Typhus

Mites (“chiggers”) transmit *Orientia tsutsugamushi*, the agent of scrub typhus, to humans. These mites occur year-round in a large area from South Asia to Australia and in much of East Asia, including Japan, China, Korea, Maritime Provinces and Sakhalin Island of Russia, and Tajikistan. Their prevalence, however, fluctuates with temperature and rainfall. Infection may occur on coral atolls in both the Indian and Pacific Oceans, in rice paddies and along canals and fields, on oil palm plantations, in tropical to desert climates and in elevated river valleys. Humans typically encounter the arthropod vector of scrub typhus in recently disturbed habitat (e.g., forest clearings) or other persisting mite foci infested with rats and other rodents.

Tick-Borne Rickettsioses

Tick-borne rickettsial diseases are most common in temperate and subtropical regions. These diseases include numerous well-known classical spotted fever rickettsioses and an expanding group of newly recognized diseases (Table below). In general, peak transmission of tick-borne rickettsial pathogens occurs during spring and summer months. Travelers who participate in outdoor activities in grassy or wooded areas (e.g., trekking, camping, or going on safari) may be at risk for acquiring tick-borne illnesses, including those caused by *Rickettsia*, *Anaplasma*, and *Ehrlichia* species (see below).

TABLE Epidemiologic features and symptoms of rickettsial diseases

ANTIGENIC GROUP	DISEASE	AGENT	PREDOMINANT SYMPTOMS*	VECTOR OR ACQUISITION MECHANISM	ANIMAL RESERVOIR	GEOGRAPHIC DISTRIBUTION OUTSIDE THE US
Typhus fevers	Epidemic typhus, Sylvatic typhus	<i>Rickettsia prowazekii</i>	Headache, chills, fever, prostration, confusion, photophobia, vomiting, rash (generally starting on trunk)	Human body louse, squirrel flea and louse	Humans, flying squirrels (US)	Cool mountainous regions of Africa, Asia, and Central and South America
	Murine typhus	<i>R. typhi</i>	As above, generally less severe	Rat flea	Rats, mice	Worldwide
Spotted fevers	African tickbite fever	<i>R. africae</i>	Fever, eschar(s), regional adenopathy,	Tick	Rodents	Sub-Saharan Africa

ANTIGENIC GROUP	DISEASE	AGENT	PREDOMINANT SYMPTOMS*	VECTOR OR ACQUISITION MECHANISM	ANIMAL RESERVOIR	GEOGRAPHIC DISTRIBUTION OUTSIDE THE US
			maculopapular or vesicular rash subtle or absent			
	Aneruptive fever	<i>R. helvetica</i>	Fever, headache, myalgia	Tick	Rodents	Old World
	Australian spotted fever	<i>R. marmionii</i>	Fever, eschar, maculopapular or vesicular rash, adenopathy	Tick	Rodents, reptiles	Australia
	Cat flea rickettsiosis	<i>R. felis</i>	As murine typhus, generally less severe	Cat and dog fleas	Domestic cats, opossums	Europe, South America
	Far Eastern spotted fever	<i>R. heilongjiangensis</i>	Fever, eschar, macular or maculopapular rash, lymphadenopathy, enlarged lymph nodes	Tick	Rodents	Far East of Russia, Northern China
	Flinders Island spotted fever, Thai tick typhus	<i>R. honei</i>	Mild spotted fever, eschar and adenopathy are rare	Tick	Not defined	Australia, Thailand
	Lymphangitis associated rickettsiosis	<i>R. sibirica</i> subsp. <i>mongolotimonae</i>	Fever, multiple eschars, regional adenopathy and lymphangitis, maculopapular rash	Tick	Rodents	Southern France, Portugal, Asia, Africa
	Maculatum infection	<i>R. parkeri</i>	Fever, eschar, rash maculopapular to vesicular	Tick	Rodents	Brazil, Uruguay
	Mediterranean spotted fevers‡	<i>R. conorii</i>	Fever, eschar, regional adenopathy, maculopapular rash on extremities	Tick	Dogs, rodents	Africa, India, Europe, Middle East, Mediterranean
	North Asian tick typhus	<i>R. sibirica</i>	Fever, eschar(s), regional adenopathy, maculopapular rash	Tick	Rodents	Russia, China, Mongolia
	Oriental spotted fever	<i>R. japonica</i>	As above	Tick	Rodents	Japan
	Queensland tick	<i>R. australis</i>	Fever, eschar,	Tick	Not defined	Australia,

ANTIGENIC GROUP	DISEASE	AGENT	PREDOMINANT SYMPTOMS*	VECTOR OR ACQUISITION MECHANISM	ANIMAL RESERVOIR	GEOGRAPHIC DISTRIBUTION OUTSIDE THE US
	typhus		regional adenopathy, rash on extremities			Tasmania
	Rickettsialpox	<i>R. akari</i>	Fever, eschar, adenopathy, disseminated vesicular rash	Mite	House mice	Russia, South Africa, Korea, Turkey, Balkan countries
	Rocky Mountain spotted fever, Sao Paulo exanthematic typhus, Minas Gerais exanthematic typhus, Brazilian spotted fever	<i>R. rickettsii</i>	Headache, fever, abdominal pain, macular rash progressing into papular or petechial (generally starting on extremities)	Tick	Rodents	Mexico, Central, and South America
	Tick-borne lymphadenopathy (TIBOLA), Dermacentor-borne necrosis and lymphadenopathy (DEBONEL)	<i>R. slovaca</i>	Necrosis erythema, cervical lymphadenopathy and enlarged lymph nodes, rare maculopapular rash	Tick	Lagomorphs, rodents	Europe, Asia
	Unnamed rickettsiosis	<i>R. aeschlimannii</i>	Fever, eschar, maculopapular rash	Tick	Domestic and wild animals	Africa
Orientia	Scrub typhus	<i>Orientia tsutsugamushi</i>	Fever, headache, sweating, conjunctival injection, adenopathy, eschar, rash (starting on trunk), respiratory distress	Mite	Rodents	South, Central, Eastern, and Southeast Asia and Australia
Coxiella	Q fever	<i>Coxiella burnetii</i>	Fever, headache, chills, sweating, pneumonia, hepatitis, endocarditis	Most human infections are acquired by inhalation of infectious aerosols; tick	Goats, sheep, cattle, domestic cats, other	Worldwide

ANTIGENIC GROUP	DISEASE	AGENT	PREDOMINANT SYMPTOMS*	VECTOR OR ACQUISITION MECHANISM	ANIMAL RESERVOIR	GEOGRAPHIC DISTRIBUTION OUTSIDE THE US
Bartonella	Cat-scratch disease	<i>Bartonella henselae</i>	Fever, adenopathy, neuroretinitis, encephalitis	Cat flea	Domestic cats	Worldwide
	Trench fever	<i>B. quintana</i>	Fever, headache, pain in shins, splenomegaly, disseminated rash	Human body louse	Humans	Worldwide
	Oroya fever	<i>B. bacilliformis</i>	Fever, headache, anemia, shifting joint and muscle pain, nodular dermal eruption	Sand fly	Unknown	Peru, Ecuador, Colombia
Ehrlichia	Ehrlichiosis	<i>Ehrlichia chaffeensis</i> [#]	Fever, headache, nausea, occasionally rash	Tick	Various large and small mammals, including deer and rodents	Worldwide
Anaplasma	Anaplasmosis	<i>Anaplasma phagocytophilum</i> [#]	Fever, headache, nausea, occasionally rash	Tick	Small mammals, and rodents	Europe, Asia, Africa
Neorickettsia	Sennetsu fever	<i>Neorickettsia sennetsu</i>	Fever, chills, headache, sore throat, insomnia	Fish, fluke	Fish	Japan, Malaysia

This represents only a partial list of symptoms. Patients may have different symptoms or only a few of those listed.

‡ Includes 4 different subspecies that can be distinguished serologically and by PCR assay, and respectively are the etiologic agents of Boutonneuse fever and Mediterranean tick fever in Southern Europe and Africa (*R. conorii* subsp. *conorii*), Indian tick typhus in South Asia (*R. conorii* subsp. *indica*), Israeli tick typhus in Southern Europe and Middle East (*R. conorii* subsp. *israelensis*), and Astrakhan spotted fever in the North Caspian region of Russia (*R. conorii* subsp. *caspiæ*).

Organisms antigenically related to these species are associated with ehrlichial diseases outside the continental United States.

Rickettsialpox

Rickettsialpox is generally an urban, mite-vector disease associated with *R. akari*-infected house mice, although feral rodent-mite reservoirs also have been described (3). Outbreaks of this illness have occurred shortly after rodent extermination programs or natural viral infections that depleted rodent populations and caused the mites to seek new hosts. *R. akari*-infected rodents have been found in urban centers in the former Soviet Union, South Africa, Korea, Croatia, and the United States. Travelers may be at risk for exposure to rodent mites when staying in old urban hostels and cabins.

Anaplasmosis and Ehrlichiosis

Human ehrlichiosis and anaplasmosis are acute tick-borne diseases, associated with the lone star tick, *Amblyomma americanum*, and *Ixodes* ticks, respectively. Because one tick may be infected with more than one tick-borne pathogen (e.g. *Borrelia burgdorferi*, the causative agent of Lyme disease, or various *Babesia* species, agent of human babesiosis), patients may present with atypical clinical symptoms that complicate treatment. Ehrlichiosis and anaplasmosis are characterized by infection of different types of leukocytes, where the causative agent multiplies in cytoplasmic membrane-bound vacuole called morulae. Morulae can sometimes be detected in Giemsa-stained blood smears.

Q FEVER

Q fever occurs worldwide, most often in persons who have contact with infected goat, sheep, cat and cattle, particularly parturient animals (especially farmers, veterinarians, butchers, meat packers, and seasonal workers). Travelers who visit farms or rural communities can be exposed to *Coxiella burnetii*, the agent of Q fever, through airborne transmission (via animal-contaminated soil and dust) or less commonly through consumption of unpasteurized milk products or by exposure to infected ticks. These infections may initially result in only mild and self-limiting influenza-like illnesses, but if untreated, infections may become chronic, particularly in persons with preexisting heart valve abnormalities or with prosthetic valves. Such persons can develop chronic and potentially fatal endocarditis.

Cat-Scratch Disease and Oroya Fever

Cat-scratch disease is contracted through scratches and bites from domestic cats, particularly kittens, infected with *Bartonella henselae*, and possibly from their fleas (3,4). Exposure can therefore occur wherever cats are found. Oroya fever is transmitted by sandflies infected with *B. bacilliformis*, which is endemic in the Andean highlands.

Symptoms

Clinical presentations of rickettsial illnesses vary (Table above), but common early symptoms, including fever, headache, and malaise, are generally nonspecific. Illnesses resulting from infection with rickettsial agents may go unrecognized or are attributed to other causes. Atypical presentations are common and may be expected with poorly characterized non-indigenous agents, so appropriate samples for examination by specialized reference laboratories should be obtained. A diagnosis of rickettsial diseases is based on two or more of the following: 1) clinical symptoms and an epidemiologic history compatible with a rickettsial disease, 2) the development of specific convalescent-phase antibodies reactive with a given pathogen or antigenic group, 3) a positive polymerase chain reaction test result, 4) specific immunohistologic detection of rickettsial agent, or 5) isolation of a rickettsial agent. Ascertaining the likely place and the nature of potential exposures is particularly helpful for accurate diagnostic testing.

Prevention

With the exception of the louse-borne diseases described above, for which contact with infectious arthropod feces is the primary mode of transmission (through autoinoculation into a wound, conjunctiva, or inhalation), travelers and health-care providers are generally not at risk for becoming infected via exposure to an ill person. Limiting exposures to vectors or animal reservoirs remains the best means for reducing the risk for disease. Travelers and persons working in areas where organisms may be present should implement prevention based on avoidance of vector-infested habitats, use of repellents and protective clothing, prompt detection and removal of arthropods from clothing and skin, and attention to hygiene.

Q fever and *Bartonella* group diseases may pose a special risk for persons with abnormal or prosthetic heart valves, and *Rickettsia*, *Ehrlichia*, and *Bartonella* for persons who are immunocompromised.

ATTACHMENT 2

ENCEPHALITIS ARBOVIRAL ENCEPHALITIDES

Encephalitis Arboviral Encephalitides

Perspectives

Arthropod-borne viruses, i.e., arboviruses, are viruses that are maintained in nature through biological transmission between susceptible vertebrate hosts by blood feeding arthropods (mosquitoes, psychodids, ceratopogonids, and ticks). Vertebrate infection occurs when the infected arthropod takes a blood meal. The term 'arbovirus' has no taxonomic significance. Arboviruses that cause human encephalitis are members of three virus families: the *Togaviridae* (genus *Alphavirus*, *Flaviviridae*, and *Bunyaviridae*).

All arboviral encephalitides are zoonotic, being maintained in complex life cycles involving a nonhuman primary vertebrate host and a primary arthropod vector. These cycles usually remain undetected until humans encroach on a natural focus, or the virus escapes this focus via a secondary vector or vertebrate host as the result of some ecologic change. Humans and domestic animals can develop clinical illness but usually are "dead-end" hosts because they do not produce significant viremia, and do not contribute to the transmission cycle. Many arboviruses that cause encephalitis have a variety of different vertebrate hosts and some are transmitted by more than one vector. Maintenance of the viruses in nature may be facilitated by vertical transmission (e.g., the virus is transmitted from the female through the eggs to the offspring).

Arboviral encephalitides have a global distribution, but there are four main virus agents of encephalitis in the United States: eastern equine encephalitis (EEE), western equine encephalitis (WEE), St. Louis encephalitis (SLE) and La Crosse (LAC) encephalitis, all of which are transmitted by mosquitoes. Another virus, Powassan, is a minor cause of encephalitis in the northern United States, and is transmitted by ticks. A new Powassan-like virus has recently been isolated from deer ticks. Its relatedness to Powassan virus and its ability to cause disease has not been well documented. Most cases of arboviral encephalitis occur from June through September, when arthropods are most active. In milder (i.e., warmer) parts of the country, where arthropods are active late into the year, cases can occur into the winter months.

The majority of human infections are asymptomatic or may result in a nonspecific flu-like syndrome. Onset may be insidious or sudden with fever, headache, myalgias, malaise and occasionally prostration. Infection may, however, lead to encephalitis, with a fatal outcome or permanent neurologic sequelae. Fortunately, only a small proportion of infected persons progress to frank encephalitis.

Experimental studies have shown that invasion of the central nervous system (CNS), generally follows initial virus replication in various peripheral sites and a period of viremia. Viral transfer from the blood to the CNS through the olfactory tract has been suggested. Because the arboviral encephalitides are viral diseases, antibiotics are not effective for treatment and no effective antiviral drugs have yet been discovered.

Prevention

Arboviral encephalitis can be prevented in two major ways: personal protective measures and public health measures to reduce the population of infected mosquitoes. Personal measures include reducing time outdoors particularly in early evening hours, wearing long pants and long sleeved shirts and applying mosquito repellent to exposed skin areas. Public health measures often require spraying of insecticides to kill juvenile (larvae) and adult mosquitoes.

Selection of mosquito control methods depends on what needs to be achieved; but, in most emergency situations, the preferred method to achieve maximum results over a wide area is aerial spraying. In many states aerial spraying may be available in certain locations as a means to control nuisance mosquitoes. Such resources can be redirected to areas of virus activity. When aerial spraying is not routinely used, such services are usually contracted for a given time period. Financing of aerial spraying costs during large outbreaks is usually provided by state emergency contingency funds. Federal funding of emergency spraying is rare and almost always requires a federal disaster declaration. Such disaster declarations usually occur when the vector-borne disease has the potential to infect large numbers of people, when a large population is at risk and when the area requiring treatment is extensive. Special large planes maintained by the United States Air Force can be called upon to deliver the insecticide(s) chosen for such emergencies. Federal disaster declarations have relied heavily on risk assessment by the CDC.

There are no commercially available human vaccines for these U.S. diseases. There is a Japanese encephalitis vaccine available in the U.S. A tick-borne encephalitis vaccine is available in Europe. An equine vaccine is available for EEE, WEE and Venezuelan equine encephalitis (VEE).

La Crosse Encephalitis

La Crosse (LAC) encephalitis was discovered in La Crosse, Wisconsin in 1963. Since then, the virus has been identified in several Midwestern and Mid-Atlantic states. During an average year, about 75 cases of LAC encephalitis are reported to the CDC. Most cases of LAC encephalitis occur in children under 16 years of age. LAC virus is a Bunyavirus and is a zoonotic pathogen cycled between the daytime-biting treehole mosquito, *Aedes triseriatus*, and vertebrate amplifier hosts (chipmunks, tree squirrels) in deciduous forest habitats. The virus is maintained over the winter by transovarial transmission in mosquito eggs. If the female mosquito is infected, she may lay eggs that carry the virus, and the adults coming from those eggs may be able to transmit the virus to chipmunks and to humans.

Historically, most cases of LAC encephalitis occur in the upper Midwestern states (Minnesota, Wisconsin, Iowa, Illinois, Indiana, and Ohio). Recently, more cases are being reported from states in the mid-Atlantic (West Virginia, Virginia and North Carolina) and southeastern (Alabama and Mississippi) regions of the country. It has long been suspected that LAC encephalitis has a broader distribution and a higher incidence in the eastern United States, but is under-reported because the etiologic agent is often not specifically identified.

LAC encephalitis initially presents as a nonspecific summertime illness with fever, headache, nausea, vomiting and lethargy. Severe disease occurs most commonly in children under the age of 16 and is characterized by seizures, coma, paralysis, and a variety of neurological sequelae after recovery. Death from LAC encephalitis occurs in less than 1% of clinical cases. In many clinical settings, pediatric cases presenting with CNS involvement are routinely screened for herpes or enteroviral etiologies. Since there is no specific treatment for LAC encephalitis, physicians often do not request the tests required to specifically identify LAC virus, and the cases are reported as aseptic meningitis or viral encephalitis of unknown etiology. Also found in the United States, Jamestown Canyon and Cache Valley viruses are related to LAC, but rarely cause encephalitis.

Eastern Equine Encephalitis

Eastern equine encephalitis (EEE) is also caused by a virus transmitted to humans and equines by the bite of an infected mosquito. EEE virus is an alphavirus that was first identified in the 1930's and currently occurs in focal locations along the eastern seaboard, the Gulf Coast and some inland Midwestern locations of the United States. While small outbreaks of human disease have occurred in the United States, equine epizootics can be a common occurrence during the summer and fall.

It takes from 4-10 days after the bite of an infected mosquito for an individual to develop symptoms of EEE. These symptoms begin with a sudden onset of fever, general muscle pains, and a headache of increasing severity. Many individuals will progress to more severe symptoms such as seizures and coma. Approximately one-third of all people with clinical encephalitis caused by EEE will die from the disease and of those who recover, many will suffer permanent brain damage with many of those requiring permanent institutional care.

In addition to humans, EEE virus can produce severe disease in: horses, some birds such as pheasants, quail, ostriches and emus, and even puppies. Because horses are outdoors and attract hordes of biting mosquitoes, they are at high risk of contracting EEE when the virus is present in mosquitoes. Human cases are usually preceded by those in horses and exceeded in numbers by horse cases which may be used as a surveillance tool.

EEE virus occurs in natural cycles involving birds and *Culiseta melanura*, in some swampy areas nearly every year during the warm months. Where the virus resides or how it survives in the winter is unknown. It may be introduced by migratory birds in the spring or it may remain dormant in some yet undiscovered part of its life cycle. With the onset of spring, the virus reappears in the birds (native bird species do not seem to be affected by the virus) and mosquitoes of the swamp. In this usual cycle of transmission, virus does not escape from these areas because the mosquito involved prefers to feed upon birds and does not usually bite humans or other mammals.

For reasons not fully understood, the virus may escape from enzootic foci in swamp areas in birds or bridge vectors such as *Coquilletidia perturbans* and *Aedes sollicitans*. These species feed on both birds and mammals and can transmit the virus to humans, horses, and other hosts. Other mosquito species such as *Ae. vexans* and *Culex nigripalpus* can also transmit EEE virus.

When health officials maintain surveillance for EEE virus activity, this movement out of the swamp can be detected, and if the level of activity is sufficiently high, can recommend and undertake measures to reduce the risk to humans.

Western Equine Encephalitis

The alphavirus western equine encephalitis (WEE) was first isolated in California in 1930 from the brain of a horse with encephalitis, and remains an important cause of encephalitis in horses and humans in North America, mainly in western parts of the USA and Canada. In the western United States, the enzootic cycle of WEE involves passerine birds, in which the infection is inapparent, and culicine mosquitoes, principally *Cx. tarsalis*, a species that is associated with irrigated agriculture and stream drainages. The virus has also been isolated from a variety of mammal species. Other important mosquito vector species include *Aedes melanimon* in California, *Ae. dorsalis* in Utah and New Mexico and *Ae. campestris* in New Mexico.

Expansion of irrigated agriculture in the North Platte River Valley during the past several decades has created habitats and conditions favorable for increases in populations of granivorous birds such as the house sparrow, *Passer domesticus*, and mosquitoes such as *Cx. tarsalis*, *Aedes dorsalis* and *Aedes melanimon*. All of these species may play a role in WEE virus transmission in irrigated areas. In addition to *Cx. tarsalis*, *Ae. dorsalis* and *Ae. melanimon*, WEE virus also has been isolated occasionally from some other mosquito species present in the area. Two confirmed and several suspect cases of WEE were reported from Wyoming in 1994. In 1995, two strains of WEE virus were isolated from *Culex tarsalis* and neutralizing antibody to WEE virus was demonstrated in sera from pheasants and house sparrows. During 1997, 35 strains of WEE virus were isolated from mosquitoes collected in Scotts Bluff County, Nebraska.

Human WEE cases are usually first seen in June or July. Most WEE infections are asymptomatic or present as mild, nonspecific illness. Patients with clinically apparent illness usually have a sudden onset with fever, headache, nausea, vomiting, anorexia and malaise, followed by altered mental status, weakness and signs of meningeal irritation. Children, especially those under 1 year old, are affected more severely than adults and may be left with permanent sequelae, which is seen in 5 to 30% of young patients. The mortality rate is about 3%.

St. Louis Encephalitis

In the United States, the leading cause of epidemic flaviviral encephalitis is St. Louis encephalitis (SLE) virus. SLE is the most common mosquito-transmitted human pathogen in the U.S. While periodic SLE epidemics have occurred only in the Midwest and southeast, SLE virus is distributed throughout the lower 48 states. Since 1964, there have been 4,437 confirmed cases of SLE with an average of 193 cases per year (range 4 - 1,967). However, less than 1% of SLE viral infections are clinically apparent and the vast majority of infections remain undiagnosed. Illness ranges in severity from a simple febrile headache to meningoencephalitis, with an overall case-fatality ratio of 5-15 %. The disease is generally milder in children than in adults, but in those children who do have disease, there is a high rate of encephalitis. The elderly are at highest risk for severe disease and death. During the summer season, SLE virus is maintained in a mosquito-bird-mosquito cycle, with periodic amplification by peridomestic birds and *Culex*

mosquitoes. In Florida, the principal vector is *Cx. nigripalpus*, in the Midwest, *Cx. pipiens pipiens* and *Cx. p. quinquefasciatus* and in the western United States, *Cx. tarsalis* and members of the *Cx. pipiens* complex.

Powassan Encephalitis

Powassan (POW) virus is a flavivirus and currently the only well documented tick-borne transmitted arbovirus occurring in the United States and Canada. Recently a Powassan-like virus was isolated from the deer tick, *Ixodes scapularis*. Its relationship to POW and its ability to cause human disease has not been fully elucidated. POW's range in the United States is primarily in the upper tier States. In addition to isolations from man, the virus has been recovered from ticks (*Ixodes marxi*, *I. cookei* and *Dermacentor andersoni*) and from the tissues of a skunk (*Spilogale putorius*). It is a rare cause of acute viral encephalitis. POW virus was first isolated from the brain of a 5-year-old child who died in Ontario in 1958. Patients who recover may have residual neurological problems.

Venezuelan Equine Encephalitis

Like EEE and WEE viruses, Venezuelan equine encephalitis (VEE) is an alphavirus and causes encephalitis in horses and humans and is an important veterinary and public health problem in Central and South America. Occasionally, large regional epizootics and epidemics can occur resulting in thousands of equine and human infections. Epizootic strains of VEE virus can infect and be transmitted by a large number of mosquito species. The natural reservoir host for the epizootic strains is not known. A large epizootic that began in South America in 1969 reached Texas in 1971. It was estimated that over 200,000 horses died in that outbreak, which was controlled by a massive equine vaccination program using an experimental live attenuated VEE vaccine. There were several thousand human infections. A more recent VEE epidemic occurred in the fall of 1995 in Venezuela and Colombia with an estimated 90,000 human infections. Infection of man with VEE virus is less severe than with EEE and WEE viruses, and fatalities are rare. Adults usually develop only an influenza-like illness, and overt encephalitis is usually confined to children. Effective VEE virus vaccines are available for equines.

Enzootic strains of VEE virus have a wide geographic distribution in the Americas. These viruses are maintained in cycles involving forest dwelling rodents and mosquito vectors, mainly *Culex (Melanoconion)* species. Occasional cases or small outbreaks of human disease are associated with these viruses, the most recent outbreaks were in Venezuela in 1992, Peru in 1994 and Mexico in 1995-96.

Other Arboviral Encephalitides

Many other arboviral encephalitides occur throughout the world. Most of these diseases are problems only for those individuals traveling to countries where the viruses are endemic.

Japanese Encephalitis

Japanese encephalitis (JE) virus is a flavivirus, related to SLE, and is widespread throughout Asia. Worldwide, it is the most important cause of arboviral encephalitis with over 45,000 cases reported annually. In recent years, JE virus has expanded its geographic distribution with outbreaks in the Pacific. Epidemics occur in late summer in temperate regions, but the infection is enzootic and occurs throughout the year in many tropical areas of Asia. The virus is maintained in a cycle involving culicine mosquitoes and waterbirds. The virus is transmitted to man by *Culex* mosquitoes, primarily *Cx. tritaeniorhynchus*, which breed in rice fields. Pigs are the main amplifying hosts of JE virus in peridomestic environments.

The incubation period of JE is 5 to 14 days. Onset of symptoms is usually sudden, with fever, headache and vomiting. The illness resolves in 5 to 7 days if there is no CNS involvement. The mortality in most outbreaks is less than 10%, but is higher in children and can exceed 30%. Neurologic sequelae in patients who recover are reported in up to 30% of cases. A formalin-inactivated vaccine prepared in mice is used widely in Japan, China, India, Korea, Taiwan and Thailand. This vaccine is currently available for human use in the United States, for individuals who might be traveling to endemic countries.

Tick-Borne Encephalitis

Tick-borne encephalitis (TBE) is caused by two closely related flaviviruses which are distinct biologically. The eastern subtype causes Russian spring-summer encephalitis (RSSE) and is transmitted by *Ixodes persulcatus*, whereas the western subtype is transmitted by *Ixodes ricinus* and causes Central European encephalitis (CEE). The name CEE is somewhat misleading, since the condition can occur throughout much of Europe. Of the two subtypes, RSSE is the more severe infection, having a mortality of up to 25% in some outbreaks, whereas mortality in CEE seldom exceeds 5%.

The incubation period is 7 to 14 days. Infection usually presents as a mild, influenza-type illness or as benign, aseptic meningitis, but may result in fatal meningoencephalitis. Fever is often biphasic, and there may be severe headache and neck rigidity, with transient paralysis of the limbs, shoulders or less commonly the respiratory musculature. A few patients are left with residual paralysis. Although the great majority of TBE infections follow exposure to ticks, infection has occurred through the ingestion of infected cows' or goats' milk. An inactivated TBE vaccine is currently available in Europe and Russia.

West Nile Encephalitis

Discussed elsewhere in this document

FLD 43A ANIMALS

Animals represent hazards because of their poisons or venoms, size and aggressiveness, diseases transmitted, or the insects they may carry.

Feral Animals

Landfills and abandoned buildings often attract stray or abandoned dogs. These animals often become pack-oriented, very aggressive, and represent serious risk of harm to unprotected workers.

Workers entering abandoned buildings should be alert for such animals and avoid approaching them since this may provoke aggressive behavior. Avoidance and protection protocols include watching for animal dens, using good housekeeping, and using repellents.

Dangerous Wild Animals

Work in remote areas inhabited by wild animals that have been known to cause injury and kill human beings, requires that companies working in these areas carefully plan for wildlife encounters. This FLD outlines actions that, when properly implemented, should provide a high degree of protection for WESTON employees and wildlife.

See Wildlife Hazard Recognition and Protection Procedure (Attached).

Venomous Snakes and Lizards

Venomous Snakes

Venomous snakes are common around the world. The major variables are the likelihood of encounter and the snake that is likely to be encountered. Encounters with snakes may be caused by moving containers, reaching into holes, or just walking through high grass, swampy areas, or rocks. **Do not attempt to catch any snakes.**

Symptom of venomous snake bites:

- Bloody wound discharge, blurred vision, burning, convulsions, diarrhea, dizziness, excessive sweating, fainting, fang marks in the skin, fever, increased thirst, local tissue death, loss of muscle coordination, nausea and vomiting, numbness and tingling, rapid pulse, severe pain, skin discoloration, swelling at the site of the bite, weakness.

Venom from venomous snakes and lizards can be divided into three types of toxins, however, there are some indications that snake venom may have more than one toxin and characteristics may change as a snake ages. The three types of toxins and their effects are:

Hemotoxins destroy blood cells and affect the circulatory system. The site of the bite rapidly becomes swollen, discolored, and painful. This is usually accompanied by swelling, discoloration, and pain progressing toward the heart.

Neurotoxins affect the nervous system and symptoms vary from foggy vision, dizziness, and other comparatively mild symptoms to rigid or flaccid paralysis, shortness of breath, weakness or paralysis of the lower limbs, double vision, inability to speak or swallow, drooping eyelids, and involuntary tremors of the facial muscles. Death can occur in as little as ten minutes, usually due to abrupt cessation of respiration.

Myotoxins destroy cells and cause muscle necrosis.

In the US, with the exception of the coral snakes which tend to have neuron-toxic venom, most venomous snakes have been categorized as having hemotoxic venom (in some areas Mojave rattlesnakes are found to have neuron-toxic venom). There is some indication that some species of rattlesnakes have both hemotoxic and neuron-toxic venom. It is also reported that venom of younger snakes may be more neuron-toxic.

There are many highly venomous snakes worldwide, some are deadly and most can be deadly without proper care.

Lizards

There are two lizards recognized as venomous, the Gila monster and the Mexican Beaded Lizard. Venom of the Gila monster is considered to be neuron-toxic and that of the Mexican Beaded Lizard is considered to be hemo-toxic.

Geographical Listing of Venomous Snakes and Lizards

Following is a list of poisonous snakes and lizards by geographic area. This list is extensive but may not be all inclusive. In planning for work around the world, also contact local agencies to determine whether there may be additional venomous snakes or lizards.

North America (including Mexico)

Copperheads (Broad-banded, Northern, Osage, Southern, Trans-Pecos)

Rattlesnakes (Banded rock, Black-tailed, Canebrake, Diamondback [eastern and western], Massasauga (eastern and western), Mojave, Mottled rock, Pacific (northern and southern), Pigmy (southeastern and western), Prairie, Red diamond, Ridge-nosed, Sidewinder, Speckled, Tiger, Timber, Twin-spotted)

Coral Snake (Arizona, Eastern, Texas, Western (red bands touching yellow "bad fellow")

Cottonmouth or water moccasin (Eastern, Florida, Western)

North America - Lizards

Gila Monster

Central and South America – Venomous Snakes

Bushmaster, Eyelash Pit Viper, Fer-de-lance, Jumping Viper, Tropical Rattlesnake

Central and South America – Venomous Lizards

Mexican Beaded Lizard

Europe

Common Adder, Long-Nosed Adder, Pallas Viper, Ursini Viper

Venomous Snakes of Africa and Asia

Boomslang, Bush Viper, Common Cobra, Egyptian Cobra, Gaboon Viper, Green Mamba, Green Tree Pit Viper, Habu Pit Viper, Horned Desert Viper, King Cobra, Krait, Levant Viper, Malayan Pit Viper, McMahon's Viper, Mole Viper or Burrowing Viper, Palestinian Viper, Puff Adder, Rhinoceros Viper or River Jack, Russel's Viper, Sand Viper, Saw-Scaled Viper, Wagler's Pit Viper or Temple Viper,

Australasia

Australian Copperhead, Death Adder, Taipan, Tiger Snake,

Poisonous Sea Snakes

Banded Sea Snake, Yellow-bellied Sea Snake

Prevention of Bites

Key factors to working safely in areas where snakes or lizards may be encountered include:

- Be alert
- Use care when reaching into or moving containers
- Use sticks or long-handled tools when reaching where you cannot see
- Be familiar with the habits and habitats of snakes in the vicinity of an incident or site
- In areas or activities where encounters with snakes are likely, wear sturdy leather or rubber work boots and snake chaps
- Do not attempt to catch snakes unless required and qualified

A snake bite warrants medical attention after administration of proper first-aid procedures. It is important to contact local medical facilities to determine where anti-venoms are located.

First-Aid

1. Keep the person calm. Restrict movement, and keep the affected area below heart level to reduce the flow of venom.

2. Remove any rings or constricting items because the affected area may swell. Create a loose splint to help restrict movement of the area.
3. If the area of the bite begins to swell and change color, the snake was probably venomous.
4. Monitor the person's vital signs -- temperature, pulse, rate of breathing, and blood pressure if possible. If there are signs of shock (such as paleness), lay the person flat, raise the feet about a foot, and cover the person with a blanket.
5. Get medical help immediately.
6. Try to photograph or identify the snake. Do not waste time hunting for the snake, and do not risk another bite. Be careful of the head of a dead snake. A snake can actually bite for up to an hour after it is dead (from a reflex).
 - DO NOT allow the person to become over-exerted. If necessary, carry the person to safety.
 - DO NOT apply a tourniquet.
 - DO NOT apply cold compresses to a snake bite.
 - DO NOT cut into a snake bite with a knife or razor.
 - DO NOT try to suction the venom by mouth.
 - DO NOT give stimulants or pain medications unless instructed to do so by a doctor.
 - DO NOT give the person anything by mouth.
 - DO NOT raise the site of the bite above the level of the person's heart
 - Transport the victim to medical attention immediately

Animal Borne Diseases

Rabies

Animal borne diseases include rabies (generally found in dogs, skunks, raccoons, bats, and foxes). Rabies varies from area to area as do the animals most likely to be rabid.

Questions and Answers about Rabies

Q. What is Rabies and how is it transmitted?

A. Rabies is a viral infection most often transmitted by bites of animals infected with the virus.

Q. What animals are most likely to be infected?

A. Skunks, raccoons, foxes, and bats are wild animals most frequently found to be infected with rabies; however, any warm blooded animal can be infected. Squirrels, groundhogs, horses, cattle, and rabbits have been tested positive for rabies. Dogs and cats are frequently rabies-infected if not immunized.

Q. How can you tell if an animal is rabies-infected?

A. Rabies infection is not always apparent. Signs to look for in wild animals are over-aggressiveness or passivity. Spotting animals which are normally nocturnal (active at night) during the day and being able to approach them would be an example of unusual behavior. Finding a bat alive and on the ground is abnormal. The best precaution, however, is to observe wild animals from a safe distance, even if they are injured. Avoid dogs and cats that you do not know.

Q. What should you do if bitten by an animal you suspect is infected with rabies?

A. As quickly as possible, wash the bite area with soap and water, then disinfect with 70% alcohol and seek medical attention for follow-up. Try to capture the animal. Avoid being bitten again or contacting the mouth or any saliva of the animal. Keep the animal under surveillance and call the police for assistance to capture it. Have the animal tested.

A dead animal believed to be infected should be preserved and tested for rabies. Health departments are often sources where information can be found regarding testing.

Q. Is there a cure for rabies?

A. Rabies is preventable, even after being bitten, if treatment is begun soon enough. Getting prompt medical attention and confirming the rabies infection of an animal are very important. **Rabies is not curable once symptoms or signs of rabies appear.**

There are vaccines available that should be considered if a work assignment involves trapping animals likely to carry rabies. Medical consultants must be involved in decisions to immunize workers against rabies.

Hantavirus

WESTON employees or contractors/subcontractors conducting field work in areas where there is evidence of a rodent population should be aware of an increased level of concern regarding the transmission of "Hantavirus"-associated diseases. Hantavirus is associated with rodents, especially the deer mouse (*Peromyscus maniculatus*) as a primary reservoir host. Hantavirus has resulted in several deaths in the U.S.

The Hantavirus can be transmitted by infected rodents through their saliva, urine, and feces. Human infection may occur when infected wastes are inhaled as a result of aerosols produced directly from the animals. They also may come from dried materials introduced into broken skin or onto mucous membranes. Infections in humans occur most in adults and are associated with activities that provide contact with infected rodents in rural/semi-rural areas. Hantavirus begins with one or more flu-like symptoms (i.e., fever, muscle aches, headache, and/or cough) and progresses rapidly to severe lung disease. Early diagnosis and treatment are vital.

Prevention

Personnel involved in work areas where rodents and the presence of the Hantavirus are known or suspected will need to take personal protective measures and to develop an expanded site safety plan.

Field personnel involved in trapping or contacting rodents or their waste products will need to wear respirators with high-efficiency particulate air (HEPA) filters, eye protection, Tyvek coveralls, chemical-resistant gloves, and disposable boot covers. Strict decontamination requirements are needed. Double-bag, label, and specific handling, packaging, shipping, storage, and analytical procedures are required to minimize the risks of exposure from collected mice. More detailed procedures can be obtained from WESTON Corporate Health and Safety.

For employees and facilities in rural/semi-rural areas, the following risk-reduction strategies are appropriate:

- Eliminate rodents and reduce availability of food sources and nesting sites used by rodents.
- Store trash/garbage in rodent-proof metal or thick plastic containers with tight lids.
- Cut all grass/underbrush in proximity to buildings.
- Prevent rodents from entering buildings (e.g., use steel wool, screen, etc., to eliminate openings).

Plague

Described under Insects (Fleas)

Anthrax

Anthrax is an acute infectious disease caused by the spore-forming bacterium *Bacillus anthracis*. Anthrax most commonly occurs in wild and domestic lower vertebrates (cattle, sheep, goats, camels, antelopes, and other herbivores), but it can also occur in humans when they are exposed to infected animals or tissue from infected animals.

Anthrax is most common in agricultural regions where it occurs in animals. These include South and Central America, Southern and Eastern Europe, Asia, Africa, the Caribbean, and the Middle East. When anthrax affects humans, it is usually due to an occupational exposure to infected animals or their products. Workers who are exposed to dead animals and animal products from other countries where anthrax is more common may become infected with *B. anthracis* (industrial anthrax). Anthrax in wild livestock has occurred in the U.S.

Anthrax infection can occur in three forms: cutaneous (skin), inhalation, and gastrointestinal. *B. anthracis* spores can live in the soil for many years, and humans can become infected with anthrax by handling products from infected animals or by inhaling anthrax spores from

contaminated animal products. Anthrax can also be spread by eating undercooked meat from infected animals. It is rare to find infected animals in the U.S.

Cutaneous: Most (about 95%) anthrax infections occur when the bacterium enters a cut or abrasion on the skin, such as when handling contaminated wool, hides, leather, or hair products (especially goat hair) of infected animals. Skin infection begins as a raised itchy bump that resembles an insect bite but within 1-2 days develops into a vesicle and then a painless ulcer, usually 1-3 cm in diameter, with a characteristic black necrotic (dying) area in the center. Lymph glands in the adjacent area may swell. About 20% of untreated cases of cutaneous anthrax will result in death. Deaths are rare with appropriate antimicrobial therapy.

Inhalation: Initial symptoms may resemble a common cold. After several days, the symptoms may progress to severe breathing problems and shock. Inhalation anthrax is usually fatal.

Intestinal: The intestinal disease form of anthrax may follow the consumption of contaminated meat and is characterized by an acute inflammation of the intestinal tract. Initial signs of nausea, loss of appetite, vomiting, and fever are followed by abdominal pain, vomiting of blood, and severe diarrhea. Intestinal anthrax results in death in 25% to 60% of cases.

Anthrax is not known to spread from one person to another person. Communicability is not a concern in managing or visiting patients with inhalation anthrax.

Prevention

In countries where anthrax is common and vaccination levels of animal herds are low, humans should avoid contact with livestock and animal products and avoid eating meat that has not been properly slaughtered and cooked. Also, an anthrax vaccine has been licensed for use in humans. The vaccine is reported to be 93% effective in protecting against anthrax.

Doctors can prescribe effective antibiotics. To be effective, treatment should be initiated early. If left untreated, the disease can be fatal.

Direct person-to-person spread of anthrax is extremely unlikely; however, a patient's clothing and body may be contaminated with anthrax spores. Effective decontamination of people can be accomplished by a thorough wash down with anti-microbe effective soap and water. Waste water should be treated with bleach or other anti-microbial agent. Effective decontamination of articles can be accomplished by boiling contaminated articles in water for 30 minutes or longer and using common disinfectants. Chlorine is effective in destroying spores and vegetative cells on surfaces. Burning the clothing is also effective. After decontamination, there is no need to immunize, treat, or isolate contacts of people ill with anthrax unless they also were also exposed to the same source of infection. Early antibiotic treatment of anthrax is essential—delay seriously lessens chances for survival. Treatment for anthrax infection and other bacterial infections includes large doses of intravenous and oral antibiotics, such as fluoroquinolones, like ciprofloxacin (cipro), doxycycline, erythromycin, vancomycin, or penicillin. In possible cases of inhalation anthrax exposure to unvaccinated personnel, early antibiotic prophylaxis treatment is crucial to prevent possible death.

No skin, especially if it has any wounds or scratches, should be exposed. Disposable personal protective equipment is preferable, but if not available, decontamination can be achieved by washing any exposed equipment in hot water, bleach and detergent. Disposable personal protective equipment and filters should be burned and buried. The size of *Bacillus anthracis* bacilli ranges from 0.5 μm to 5.0 μm . Anyone working with anthrax in a suspected or confirmed victim should wear respiratory equipment capable of filtering this size of particle or smaller. The U.S. National Institute for Occupational Safety and Health (NIOSH) and Mine Safety and Health Administration (MSHA) approved high efficiency-respirator, such as a half-face disposable respirator with a HEPA filter, is recommended. All possibly contaminated bedding or clothing should be isolated in double plastic bags and treated as possible bio-hazard waste. Dead victims that are opened and not burned provide an ideal source of anthrax spores; the victim should be sealed in an airtight body bag. Cremating victims is the preferred way of handling body disposal. No embalming or autopsy should be attempted without a fully equipped biohazard lab and trained and knowledgeable personnel.

Delays of only a few days may make the disease untreatable and treatment should be started even without symptoms if possible contamination or exposure is suspected. Animals with anthrax often just die without any apparent symptoms. Initial symptoms may resemble a common cold – sore throat, mild fever, muscle aches and malaise. After a few days, the symptoms may progress to severe breathing problems and shock and ultimately death. Death can occur from about two days to a month after exposure with deaths apparently peaking at about 8 days after exposure. ^[8] Antibiotic-resistant strains of anthrax are known.

Aerial spores can be trapped by a simple HEPA or P100 filter. Inhalation of anthrax spores can be prevented with a full-face mask using appropriate filtration. Unbroken skin can be decontaminated by washing with simple soap and water. All of these procedures do not kill the spores which are very hard to kill and require extensive treatment to eradicate them. Filters, clothes, etc. exposed to possible anthrax contaminated environments should be treated with chemicals or destroyed by fire to minimize the possibility of spreading the contamination.

In recent years there have been many attempts to develop new drugs against anthrax; but the existing supply still works fine if treatment is started soon enough.

Prevention can also be accomplished through early detection. In response to the U.S. Postal Service (USPS) anthrax attacks of October 2001, the USPS has installed BioDetection Systems (BDS) in their large-scale mail cancellation facilities. BDS response plans have been formulated by the USPS in conjunction with local responders including fire, police, hospitals, and public health. Employees of these facilities have been educated about anthrax, response actions and prophylactic medication. Because of the time delay inherent in getting final verification that anthrax has been used, prophylactic antibiotics for possibly exposed personnel should commence as soon as possible.

The ultimate in prevention is vaccination against infection but this has to be done well in advance of exposure.

Anthrax spores can survive for long periods of time in the environment after release. Methods for cleaning anthrax contaminated sites commonly use oxidizing agents such as peroxides, ethylene Oxide, Sandia Foam, chlorine dioxide (used in the Hart Senate office building), and liquid bleach products containing sodium hypochlorite. These agents slowly destroy bacterial spores. A bleach solution for treating hard surfaces has been approved by the EPA and can be prepared by mixing one part bleach (5.25%-6.00%) to one part white vinegar to eight parts water. Bleach and vinegar must not be combined together directly, rather some water must first be added to the bleach (e.g., two cups water to one cup of bleach), then vinegar (e.g., one cup), and then the rest of the water (e.g., six cups). The pH of the solution should be tested with a paper test strip; and treated surfaces must remain in contact with the bleach solution for 60 minutes (repeated applications will be necessary to keep the surfaces wet).

Chlorine dioxide has emerged as the preferred biocide against anthrax-contaminated sites, having been employed in the treatment of numerous government buildings over the past decade. Its chief drawback is the need for in situ processes to have the reactant on demand.

To speed the process, trace amounts of a non-toxic catalyst composed of iron and tetro-amido macrocyclic ligands are combined with sodium carbonate and bicarbonate and converted into a spray. The spray formula is applied to an infested area and is followed by another spray containing tertiary-butyl hydroperoxide

Using the catalyst method, a complete destruction of all anthrax spores takes 30 minutes. A standard catalyst-free spray destroys fewer than half the spores in the same amount of time. They can be heated, exposed to the harshest chemicals, and they do not easily die.

Brucellosis

Brucellosis, also called undulant fever or Malta fever, is a zoonosis (infectious disease transmitted from animals to humans) caused by bacteria of the genus *Brucella*. It is primarily a disease of domestic animals (goats, pigs, cattle, dogs, etc.) and humans and has a worldwide distribution.

Although brucellosis can be found worldwide, it is more common in countries that do not have good standardized and effective public health and domestic animal health programs. Areas currently listed as high risk are the Mediterranean Basin (Portugal, Spain, Southern France, Italy, Greece, Turkey, North Africa), South and Central America, Eastern Europe, Asia, Africa, the Caribbean, and the Middle East.

The disease is transmitted either through contaminated or untreated milk (and its derivatives) or through direct contact with infected animals, which may include dogs, pigs, camels, and ruminants, primarily sheep, goats, cattle, and bison. This also includes contact with their carcasses.

Leftovers from parturition are also extremely rich in highly virulent brucellae. Brucellae, along with leptospira have the unique property of being able to penetrate through intact human skin, so infection by mere hand contact with infectious material is likely to occur.

The disease is now usually associated with the consumption of un-pasteurized milk and soft cheeses made from the milk of infected animals and with occupational exposure of veterinarians and slaughterhouse workers. Some vaccines used in livestock, most notably *B. abortus* strain 19 also cause disease in humans if accidentally injected. Problems with vaccine induced cases in the United States declined after the release of the RB-51 strain developed in the 1990s and the relaxation of laws requiring vaccination of cattle in many states.

The incubation period of brucellosis is, usually, of one to three weeks, but some rare instances may take several months to surface.

Brucellosis induces inconstant fevers, sweating, weakness, anemia, headaches, depression and muscular and bodily pain.

The symptoms are like those associated with many other febrile diseases, but with emphasis on muscular pain and sweating. The duration of the disease can vary from a few weeks to many months or even years. In first stage of the disease, septicaemia occurs and leads to the classic triad of undulant fevers, sweating (often with characteristic smell, likened to wet hay) and migratory arthralgia and myalgia.

Prevention

The main way of preventing brucellosis is by using fastidious hygiene in producing raw milk products, or by pasteurization of all milk that is to be ingested by human beings, either in its pure form or as a derivate, such as cheese.

Provide protection from skin contact when handling potentially infected animals.

Q fever

Q fever is caused by infection with *Coxiella burnetii*. This organism is uncommon but may be found in cattle, sheep, goats and other domestic mammals, including cats and dogs. The infection results from inhalation of contaminated particles in the air, and from contact with the vaginal mucus, milk, feces, urine or semen of infected animals. The incubation period is 9-40 days. It is considered possibly the most infectious disease in the world, as a human being can be infected by a single bacterium.

The most common manifestation is flu-like symptoms with abrupt onset of fever, malaise, profuse perspiration, severe headache, myalgia (muscle pain), joint pain, loss of appetite, upper respiratory problems, dry cough, pleuritic pain, chills, confusion and gastro-intestinal symptoms such as nausea, vomiting and diarrhea. The fever lasts approximately 7-14 days.

During the course, the disease can progress to an atypical pneumonia, which can result in a life threatening acute respiratory distress syndrome (ARDS), whereby such symptoms usually occur during the first 4-5 days of infection.

Less often the Q fever causes (granulomatous) hepatitis which becomes symptomatic with malaise, fever, liver enlargement (hepatomegaly), pain in the right upper quadrant of the abdomen and jaundice (icterus).

The chronic form of the Q fever is virtually identical with the inflammation of the inner lining of the heart (endocarditis), which can occur after months or decades following the infection. It is usually deadly if untreated. However, with appropriate treatment this lethality is around 10%.

The pathogenic agent is to be found everywhere except Antarctica and New Zealand. In Europe it appears as hepatitis rather than pneumonia as in the United States. The common way of infection is inhalation of contaminated dust, contact with contaminated milk, meat, wool and particularly birthing products. Ticks can transfer the pathogenic agent to other animals. Transfer between humans seems extremely rare and has so far been described in very few cases.

Prevention

Q fever is effectively prevented by intradermal vaccination with a vaccine composed of killed *Coxiella burnetii* organisms. Skin and blood tests should be done before vaccination to identify preexisting immunity; the reason is that vaccinating subjects who already have immunity can result in a severe local reaction. After a single dose of vaccine, protective immunity lasts for many years. Revaccination is not generally required. Annual screening is typically recommended.

Wear appropriate PPE when handling potentially infected animals or materials.

Leptospirosis

Leptospirosis is a bacterial disease that affects humans and animals. It is caused by bacteria of the genus *Leptospira*.

The time between a person's exposure to a contaminated source and becoming sick is 2 days to 4 weeks. Illness usually begins abruptly with fever and other symptoms. Leptospirosis may occur in two phases; after the first phase, with fever, chills, headache, muscle aches, vomiting, or diarrhea, the patient may recover for a time but become ill again. If a second phase occurs, it is more severe; the person may have kidney or liver failure or meningitis. This phase is also called Weil's disease.

The illness lasts from a few days to 3 weeks or longer. Without treatment, recovery may take several months. In rare cases death occurs.

Many of these symptoms can be mistaken for other diseases. Leptospirosis is confirmed by laboratory testing of a blood or urine sample.

Leptospira organisms have been found in cattle, pigs, horses, dogs, rodents, and wild animals. Humans become infected through contact with water, food, or soil containing waste from these infected animals. This may happen by consuming contaminated food or water or through skin

contact, especially with mucosal surfaces, such as the eyes or nose, or with broken skin. The disease is not known to be spread from person to person.

Leptospirosis occurs worldwide but is most common in temperate or tropical climates. It is an occupational hazard for many people who work outdoors or with animals, for example, farmers, sewer workers, veterinarians, fish workers, dairy farmers, or military personnel. It is a recreational hazard for campers or those who participate in outdoor sports in contaminated areas and has been associated with swimming, wading, and whitewater rafting in contaminated lakes and rivers. The incidence is also increasing among urban children.

The risk of acquiring leptospirosis can be greatly reduced by not swimming or wading in water that might be contaminated with animal urine.

Protective clothing or footwear should be worn by those exposed to contaminated water or soil because of their job or recreational activities.

Prevention

Avoid risky foods and drinks.

Buy it bottled or bring it to a rolling boil for 1 minute before drink it. Bottled carbonated water is safer than non-carbonated water.

Ask for drinks without ice unless the ice is made from bottled or boiled water. Avoid popsicles and flavored ices that may have been made with contaminated water.

Eat foods that have been thoroughly cooked and that are still hot and steaming

Avoid raw vegetables and fruits that cannot be peeled. Vegetables like lettuce are easily contaminated and are very hard to wash well. When eating raw fruit or vegetables that can be peeled, peel them yourself. (Wash your hands with soap first.) Do not eat the peelings.

Avoid foods and beverages from street vendors. It is difficult for food to be kept clean on the street, and many travelers get sick from food bought from street vendors.

Leptospirosis is treated with antibiotics, such as doxycycline or penicillin, which should be given early in the course of the disease. Intravenous antibiotics may be required for persons with more severe symptoms. Persons with symptoms suggestive of leptospirosis should contact a health care provider.

Machupo virus

Machupo virus, Bolivian hemorrhagic fever (BHF), also known as **black typhus** is a hemorrhagic fever and zoonotic infectious disease occurring in Bolivia. First identified in 1959, black typhus is caused by infection with machupo virus, a negative single-stranded RNA virus of the arenaviridae family. The infection has a slow onset with fever, malaise, headache and muscular pains. Petechiae (blood spots) on the upper body and bleeding from the nose and gums

are observed when the disease progresses to the hemorrhagic phase, usually within seven days of onset. The mortality rate is estimated at 5 to 30 percent.

The vector is the vesper mouse (*Calomys callosus*), a rodent indigenous to northern Bolivia. Infected animals are asymptomatic and shed virus in excretions, by which humans are infected. Evidence of person-to-person transmission of Machupo virus exists but is believed to be rare (Kilgore, et. al, 1995).

Measures to reduce contact between the vesper mouse and humans have effectively limited the number of outbreaks, with no cases identified between 1973 and 1994. A vaccine being developed for the genetically related Junín virus which causes Argentine hemorrhagic fever has shown evidence of cross-reactivity with Machupo virus and may be an effective prophylactic measure for people at high risk of infection.

Prevention

Appropriate PPE including respiratory protection for handling animals or when there is potential exposure to wastes from the animals.

Ebola

Ebola is both the common term used to describe a group of viruses belonging to genus Ebolavirus, family Filoviridae, and the common name for the disease which they cause, Ebola hemorrhagic fever. Ebola viruses are morphologically similar to the Marburg virus, also in the family Filoviridae, and share similar disease symptoms. Ebola has caused a number of serious and highly publicized outbreaks since its discovery.

It is known to be a zoonotic virus as it is currently devastating the populations of lowland gorillas in Central Africa. Despite considerable effort by the World Health Organization, no animal reservoir capable of sustaining the virus between outbreaks has been identified. However, it has been hypothesized that the most likely candidate is the fruit bat.

Ebola hemorrhagic fever is potentially lethal and encompasses a range of symptoms including fever, vomiting, diarrhea, generalized pain or malaise, and sometimes internal and external bleeding. Mortality rates are extremely high, with the human case-fatality rate ranging from 50% - 89%, according to viral subtype.^[2] The cause of death is usually due to hypovolemic shock or organ failure.

Because Ebola is potentially lethal and since no approved vaccine or treatment is available, Ebola is classified as a biosafety level 4 agent, as well as a Category A bioterrorism agent by the Centers for Disease Control and Prevention.

Symptoms are varied and often appear suddenly. Initial symptoms include high fever (at least 38.8°C), severe headache, muscle joint, or abdominal pain, severe weakness and exhaustion, sore throat, nausea, and dizziness. Before an outbreak is suspected, these early symptoms are easily

mistaken for malaria, typhoid fever, dysentery, influenza, or various bacterial infections, which are all far more common and less reliably fatal.

Ebola may progress to cause more serious symptoms, such as diarrhea, dark or bloody feces, vomiting blood, red eyes due to distention and hemorrhage of sclerotic arterioles, petechia, maculopapular rash, and purpura. Other secondary symptoms include hypotension (less than 90 mm Hg systolic /60 mm Hg diastolic), hypovolemia, tachycardia, organ damage (especially the kidneys, spleen, and liver) as a result of disseminated systemic necrosis, and proteinuria. The interior bleeding is caused by a chemical reaction between the virus and the platelets which creates a chemical that will cut cell sized holes into the capillary walls.

Among humans, the virus is transmitted by direct contact with infected body fluids, or to a lesser extent, skin or mucus membrane contact. The incubation period can be anywhere from 2 to 21 days, but is generally between 5 and 10 days.

Although airborne transmission between monkeys has been demonstrated by an accidental outbreak in a laboratory located in Virginia, USA, there is very limited evidence for human-to-human airborne transmission in any reported epidemics.

The infection of human cases with Ebola virus has been documented through the handling of infected chimpanzees, gorillas, and forest antelopes--both dead and alive--as was documented in Côte d'Ivoire, the Republic of Congo and Gabon. The transmission of the Ebola Reston strain through the handling of cynomolgus monkeys has also been reported.^[7]

So far, all epidemics of Ebola have occurred in sub-optimal hospital conditions, where practices of basic hygiene and sanitation are often either luxuries or unknown to caretakers and where disposable needles and autoclaves are unavailable or too expensive. In modern hospitals with disposable needles and knowledge of basic hygiene and barrier nursing techniques, Ebola rarely spreads on such a large scale.

Prevention

Prevention methods include good hygiene in medical settings and awareness of the virus in travel areas. There is no known effective vaccine for humans.

Prevention efforts should concentrate on avoiding contact with host or vector species. Travelers should not visit locations where an outbreak is occurring. Contact with rodents should be avoided. Minimize exposure to arthropod bites by using permethrin-impregnated bed nets and insect repellents.

Strict compliance with infection control precautions (i.e., use of disposable gloves, face shields, and disposable gowns to prevent direct contact with body fluids and splashes to mucous membranes when caring for patients or handling clinical specimens; appropriate use and disposal of sharp instruments; hand washing and use of disinfectants) is recommended to avoid health care-associated infections.

Contact with dead primates should be avoided.

Marburg Virus

The **Marburg virus** is the causative agent of **Marburg hemorrhagic fever**. Both the disease and virus are related to Ebola and originate in Uganda and Eastern Congo. The zoonosis is of unknown origin, but fruit bats are suspected. In the spring of 2005, there was an outbreak in Angola.

Because many of the signs and symptoms of Marburg hemorrhagic fever are similar to those of other infectious diseases, such as malaria or typhoid, diagnosis of the disease can be difficult, especially if only a single case is involved.

The disease is spread through bodily fluids, including blood, excrement, saliva, and vomit.

Early symptoms are often non-specific, and usually include fever, headache and myalgia after an incubation period of 3-9 days. After five days, a macropapular rash is often present on the trunk. Later-stage Marburg infection is acute and can include jaundice, pancreatitis, weight loss, delirium and neuropsychiatric symptoms, hemorrhaging, hypovolemic shock and multi-organ dysfunction with liver failure most common.

Accounts of external hemorrhaging from bodily orifices are in fact rare. Time course varies but symptoms usually last for one to three weeks until the disease either resolves or kills the infected host. The fatality rate is between 23-90%.

Prevention

Prevention methods include good hygiene in medical settings and awareness of the virus in travel areas. There is no known effective vaccine for humans.

Prevention efforts should concentrate on avoiding contact with host or vector species. Travelers should not visit locations where an outbreak is occurring. Contact with rodents should be avoided. Minimize exposure to arthropod bites by using permethrin-impregnated bed nets and insect repellents.

Strict compliance with infection control precautions (i.e., use of disposable gloves, face shields, and disposable gowns to prevent direct contact with body fluids and splashes to mucous membranes when caring for patients or handling clinical specimens; appropriate use and disposal of sharp instruments; hand washing and use of disinfectants) is recommended to avoid health care-associated infections.

Contact with dead primates should be avoided.

Rift Valley Fever.

Rift Valley Fever (RVF) is a viral Zoonosis affects primarily domestic livestock, but can be passed to humans) causing fever. It is spread by the bite of infected mosquitoes. The disease is caused by the RVF virus, a member of the genus *Phlebovirus* (family *Bunyaviridae*).

The disease was first reported in Kenya around 1915 and has since been reported across sub-Saharan Africa. There have been outbreaks in Egypt in 1977-78, Saudi Arabia and Yemen..

In humans the virus can cause several different syndromes. Usually sufferers have either no symptoms or only a mild illness with fever, headache, myalgia and liver abnormalities. In a small percentage of cases (< 2%) the illness can progress to hemorrhagic fever syndrome, meningoencephalitis (inflammation of the brain), or affecting the eye. Patients who become ill usually experience fever, generalized weakness, back pain, dizziness, and weight loss at the onset of the illness. Typically, patients recover within 2-7 days after onset.

The vast majority of human infections result from direct or indirect contact with the blood or organs of infected animals. The virus can be transmitted to humans through the handling of animal tissue during slaughtering or butchering, assisting with animal births, conducting veterinary procedures, or from the disposal of carcasses or fetuses. Certain occupational groups such as herders, farmers, slaughterhouse workers and veterinarians are therefore at higher risk of infection. The virus infects humans through inoculation, for example via a wound from an infected knife or through contact with broken skin, or through inhalation of aerosols produced during the slaughter of infected animals. The aerosol mode of transmission has also led to infection in laboratory workers.

There is some evidence that humans may also become infected with RVF by ingesting the unpasteurized or uncooked milk of infected animals.

Human infections have also resulted from the bites of infected mosquitoes, most commonly the *Aedes* mosquito.

Transmission of RVF virus by hematophagous (blood-feeding) flies is also possible.

To date, no human-to-human transmission of RVF has been documented, and no transmission of RVF to health care workers has been reported when standard infection control precautions have been put in place.

There has been no evidence of outbreaks of RVF in urban areas.

Mild form of RVF in humans

The incubation period (interval from infection to onset of symptoms) for RVF varies from two to six days.

Those infected either experience no detectable symptoms or develop a mild form of the disease characterized by a feverish syndrome with sudden onset of flu-like fever, muscle pain, joint pain and headache.

Some patients develop neck stiffness, sensitivity to light, loss of appetite and vomiting; in these patients the disease, in its early stages, may be mistaken for meningitis.

The symptoms of RVF usually last from four to seven days, after which time the immune response becomes detectable with the appearance of antibodies and the virus gradually disappears from the blood.

Severe form of RVF in humans

While most human cases are relatively mild, a small percentage of patients develop a much more severe form of the disease. This usually appears as one or more of three distinct syndromes: ocular (eye) disease (0.5-2% of patients), meningoencephalitis (less than 1%) or haemorrhagic fever (less than 1%).

Ocular form: In this form of the disease, the usual symptoms associated with the mild form of the disease are accompanied by retinal lesions. The onset of the lesions in the eyes is usually one to three weeks after appearance of the first symptoms. Patients usually report blurred or decreased vision. The disease may resolve itself with no lasting effects within 10 to 12 weeks. However, when the lesions occur in the macula, 50% of patients will experience a permanent loss of vision. Death in patients with only the ocular form of the disease is uncommon.

Meningoencephalitis form: The onset of the meningoencephalitis form of the disease usually occurs one to four weeks after the first symptoms of RVF appear. Clinical features include intense headache, loss of memory, hallucinations, confusion, disorientation, vertigo, convulsions, lethargy and coma. Neurological complications can appear later (> 60 days). The death rate in patients who experience only this form of the disease is low, although residual neurological deficit, which may be severe, is common.

Haemorrhagic fever form: The symptoms of this form of the disease appear two to four days after the onset of illness, and begin with evidence of severe liver impairment, such as jaundice. Subsequently signs of haemorrhage then appear such as vomiting blood, passing blood in the faeces, a purpuric rash or ecchymoses (caused by bleeding in the skin), bleeding from the nose or gums, menorrhagia and bleeding from venepuncture sites. The case-fatality ratio for patients developing the haemorrhagic form of the disease is high at approximately 50%. Death usually occurs three to six days after the onset of symptoms. The virus may be detectable in the blood for up to 10 days, in patients with the hemorrhagic icterus form of RVF.

The total case fatality rate has varied widely between different epidemics but, overall, has been less than 1% in those documented. Most fatalities occur in patients who develop the haemorrhagic icterus form.

A person's chances of becoming infected can be reduced by taking measures to decrease contact with mosquitoes and other bloodsucking insects through the use of mosquito repellents and bednets. Avoiding exposure to blood or tissues of animals that may potentially be infected is an important protective measure for persons working with animals in RVF-endemic areas.

Prevention

Awareness and use of PPE, good hygiene and other avoidance practices used for other zoonotic diseases should be used.

Nipah and Hendra Viruses

Nipah virus is a newly recognized zoonotic virus. The virus was 'discovered' in 1999. It has caused disease in animals and in humans, through contact with infectious animals. The virus is named after the location where it was first detected in Malaysia.

Nipah is closely related to another newly recognized zoonotic virus (1994), called **Hendra** virus, named after the town where it first appeared in Australia. Both Nipah and Hendra are members of the virus family *Paramyxoviridae*. Although members of this group of viruses have only caused a few focal outbreaks, the biologic property of these viruses to infect a wide range of hosts and to produce a disease causing significant mortality in humans has made this emerging viral infection a public health concern.

Natural Host

It is currently believed that certain species of fruit bats are the natural hosts of both Nipah and Hendra viruses. They are distributed across an area encompassing northern, eastern and south-eastern areas of Australia, Indonesia, Malaysia, the Philippines and some of the Pacific Islands. The bats appear to be susceptible to infection with these viruses, but do not themselves become ill. It is not known how the virus is transmitted from bats to animals.

Transmission

The mode of transmission from animal to animal, and from animal to human is uncertain, but appears to require close contact with contaminated tissue or body fluids from infected animals. Nipah antibodies have been detected in pigs, other domestic and wild animals. The role of species other than pigs in transmitting infection to other animals has not yet been determined.

It is unlikely that Nipah virus is easily transmitted to man, although previous outbreak reports suggest that Nipah virus is transmitted from animals to humans more readily than Hendra virus. Despite frequent contact between fruit bats and humans there is no serological evidence of human infection among bat carers. Pigs were the apparent source of infection among most human cases in the Malaysian outbreak of Nipah, but other sources, such as infected dogs and cats, cannot be excluded. Human-to-human transmission of Nipah virus has not been reported.

Clinical Features

Nipah Virus - The incubation period is between 4 and 18 days. In many cases the infection is mild or inapparent (sub-clinical). In symptomatic cases, the onset is usually with "influenza-like" symptoms, with high fever and muscle pains (myalgia). The disease may progress to

inflammation of the brain (encephalitis) with drowsiness, disorientation, convulsions and coma. Fifty percent of clinically apparent cases die.

Hendra Virus - respiratory illness with severe flu-like signs and symptoms

Protection

The risk of transmission of Nipah and virus from sick animals to humans is thought to be low, and transmission from person-to-person has not yet been documented, even in the context of a large outbreak. Therefore, the risk of transmission of Nipah virus to health care workers is thought to be low. However, transmission without percutaneous exposure (through a break in the skin barrier) is theoretically possible, as respiratory secretions contain the virus. This is why it has been categorized as a biohazardous agent that should be managed in a high-level biosecurity laboratory. It is recommended that close contact with body fluids and infected tissues be avoided if Nipah or hendra virus infection is suspected.

Bird and Bat Borne or Enhanced Diseases

See also under Molds and Fungus

Psittacosis

Psittacosis is a disease caused by a bacteria that is found in bird droppings and other secretions (often carried by pet birds). The bacteria is found worldwide.

Symptoms of psittacosis infection may include a low-grade fever that often becomes worse as the disease progresses, including anorexia, sore throat, light sensitivity, and a severe headache.

Ammonia and sodium hypochlorite based disinfectants are effective disinfectants for Psittacosis.

Where it is necessary to remove bat droppings from buildings prior to renovation or demolition it is prudent to assume infection and use the following precautions:

- Avoid areas that may harbor the bacteria, e.g., accumulations of bird or bat droppings.
- Areas known or suspected of being contaminated by *the organisms causing* Psittacosis such as bird roosts, attics, or even entire buildings that contain accumulations of bat or bird manure, should be posted with signs warning of the health risk. The building or area should be secured
- Before an activity is started that may disturb any material that might be contaminated by Psittacosis, workers should be informed in writing of the personal risk factors that increase an individual's chances of developing these diseases. Such a written communication should include a warning that individuals with weakened immune systems are at the greatest risk of developing severe forms of these diseases become infected. These people should seek advice from their health care provider about whether they should avoid exposure to materials that might be contaminated with these organisms.

The best way to prevent exposure is to avoid situations where material that might be contaminated can become aerosolized and subsequently inhaled. A brief inhalation exposure to highly contaminated dust may be all that is needed to cause infection and subsequent development of psittacosis. Therefore, work practices and dust control measures that eliminate or reduce dust generation during the removal of bat manure from a building will also reduce risks of infection and subsequent development of disease. For example, instead of shoveling or sweeping dry, dusty material, carefully wetting it with a water spray can reduce the amount of dust aerosolized during an activity. Adding a surfactant or wetting agent to the water might reduce further the amount of aerosolized dust.

Once the material is wetted, it can be collected in double, heavy-duty plastic bags, a 55-gallon drum, or some other secure container for immediate disposal. An alternative method is use of an

industrial vacuum cleaner with a high-efficiency filter to *bag* contaminated material. Truck-mounted or trailer-mounted vacuum systems are recommended for buildings with large accumulations of bat or bird manure. These high-volume systems can remove tons of contaminated material in a short period. Using long, large-diameter hoses, such a system can also remove contaminated material located several stories above its waste hopper. This advantage eliminates the risk of dust exposure that can happen when bags tear accidentally or containers break during their transfer to the ground.

The removal of all material that might be contaminated from a building and immediate waste disposal will eliminate any further risk that someone might be exposed to aerosolized spores. Air sampling, surface sampling, or the use of any other method intended to confirm that no infectious agents remain following removal of bat manure is unnecessary in most cases. However, before a removal activity is considered finished, the cleaned area should be inspected visually to ensure that no residual dust or debris remains.

Spraying 1:10 bleach to water mixture on droppings and allowing it to dry is also a recommended practice for the psittacosis organisms.

Because work practices and dust control measures to reduce worker exposures to these organisms have not been fully evaluated, using personal protective equipment is still necessary during some activities. During removal of an accumulation of bat or bird manure from an enclosed area such as an attic, dust control measures should be used, but wearing a NIOSH-approved respirator and other items of personal protective equipment is also recommended to reduce further the risk of exposure to the organisms that cause Psittacosis.

Treatment

Psittacosis is often hard to diagnose and while a concern, it does not occur with great frequency. Knowledge of the symptoms and of potential exposure is important when seeking medical follow-up for potential exposure.

There are various medical treatments for psittacosis based on extent of infection. The sooner the disease is diagnosed and treatment is begun the more effective the treatment will be.

APPENDIX A

Dangerous Animals - Wildlife Hazard Recognition and Protection

GENERAL

Work in remote areas inhabited by wild animals that have been known to cause injury and kill human beings, requires that companies working in these areas carefully plan for wildlife encounters. This procedure outlines actions that when properly implemented should provide a high degree of protection for employees and wildlife.

These procedures apply to employees who prepare Health and Safety Plans or perform fieldwork in environments in which wild animals may be encountered. However, due to the unpredictable nature of wild animals this single document cannot possibly cover all potential risks or protective measures. Therefore, prior to entering remote areas inhabited by dangerous wildlife, contact local wildlife agencies to gather additional information concerning local risks and protective measures.

REFERENCES

Alaska Administrative Code 5 AAC 92.230 and 5 AAC 92.410.

Alaska Department of Fish and Game, Division of Wildlife Conservation.

<http://www.state.ak.us/adfg/adfghome.htm>

State of Washington Fish and Wildlife, Living with Wildlife.

<http://www.wa.gov/wdfw/wildlife.htm>

ATTACHMENTS

Attachments 1 through 4 outline behavioral characteristics of and outline controls that will minimize human injury, loss of property, and unnecessary destruction of wildlife, while ensuring a safe work environment. Attachment 5 provides the Project Specific Exemption for Firearms request form.

RESPONSIBILITIES

The responsibilities of personnel involved in Wildlife Hazard Recognition and Protection are:

- The Corporate EHS Manager (EHS Manager) review and approval of site health and safety plans (HSP) that require the Project Specific Exemption for Firearms.
- Project Manager / Site Manager: In addition to the safety responsibilities described in the Safety Program Implementation Plan, the Project Manager (PM) or Site Manager (SM) are responsible for ensuring that the Health and Safety Plan (HSP) addresses hazards associated with wild animal encounters, as appropriate and ensuring that persons designated to carry firearms meet the criteria outlined in this procedure. Additionally, if other approvals are necessary for carrying firearms, the PM must ensure that adequate time is allotted for the approval process.

WILDLIFE AVOIDANCE AND BASIC PROTECTIVE MEASURES

The best protective measure is simply avoidance. Large numbers of humans present deterrence to wild animals; therefore, whenever possible teams in the field should work together in groups of four or more. Whenever practical, fieldwork should be scheduled around the seasonal cycles of wildlife in the area. When wild animal avoidance cannot be achieved through scheduling,

personnel involved in field activities in which encounters with wild animals may result, will take the following steps and will be equipped and trained, as set forth below.

CLEAR THE AREA

Evaluate and control the area before entry by

- Determine areas of recent sightings through local Fish and Game, state troopers, etc.;
- Conduct a site observation from an off-site elevated point, if possible;
- Conduct a controlled walk through in the area by a trained observer;
- Arrange a briefing by a local specialist, e. g., Fish and Game, etc.; and
- Utilizing appropriate noisemakers.

BASIC EQUIPMENT

Employees entering an environment where encounters with wild animals are possible should be provided, as a minimum:

- Noisemakers, such as air horns, bells, etc.; and
- Bear spray of not less than 16-ounce capacity (with holster), equivalent to capsicum pepper (red pepper extract), which is capable of spraying at least 15 feet. (Notes: Normally cannot be transported in side aircraft passenger compartments and may be considered a hazardous material, check with airlines and hazardous material shippers for current information).

TRAINING

Prior to entering and / or working in areas inhabited by dangerous wildlife each employee should receive training as outlined in this procedure. At a minimum, training must include information related to:

- Wildlife present, habitat, behavior patterns, including when wild animals are most active, etc.
- Warning signs, such as tracks, bedding areas, scat, claw marks, offspring, paths, etc.,
- Avoidance measures
- Other hazards, precautions, and protective measures as outlined in the Attachments,
- (At the jobsite) spray demonstration and safety instructions which include location of and persons designated as "bear watch"

An outline of the training content should be reviewed and approved by the Divisional EHS manager and should be documented. A record of the training will be maintained at the job site, filed with the SSHSP and in the employee's training records.

SUPPLEMENTAL PROTECTION

In some areas it may be necessary (or preferred) to employ professional hunting guide services where significant possibility of encounters with wildlife exist. The PM and DSM will evaluate the need for supplemental protection. In addition to Weston's standard minimum qualifications for subcontractors, prospective bear and wild animal protection contractors must be able to provide evidence of competency. This evidence shall include:

- Proof of firearm safety training and;
- Proficiency with firearms and;
- Should have three or more years experience providing similar services.

In addition to the above, project managers should review insurance coverage with the Risk Management office to determine whether or not additional insurances should be required.

FIREARMS USE BY WESTON PERSONNEL OR SUBCONTRACTOR EMPLOYEES

In some situations, the Project Manager (with approved exemption) and client agreement may authorize selected employees or subcontractor employees to carry firearms.

Employees designated to carry firearms must demonstrate proficiency in firearm safety marksmanship through successful completion of a firearm safety training class administered by a Fish and Game Department, a local firearm range instructor, or other approved trainer. Personnel designated to carry firearms must not have been convicted of a crime that has resulted in their loss of the privilege to bear arms; therefore, they must submit to a background check through the NCIC.

Training will be documented and records of training will be maintained on site. At a minimum training must include:

- Animal behavior,
- Firearm handling and safety,
- Demonstrated marksmanship skills, and
- Safe storage of firearms and ammunition.

FIREARMS AUTHORIZED FOR SITE USE

- **Will not** be carried with a round in the chamber until a dangerous encounter is eminent, such as when a bear has been sighted in the immediate area, and
- **Must** be unloaded with a trigger lock installed when not actively being used for protection to prevent unauthorized persons from using the firearm.
- **Will** be stored in a locked cabinet when not required for use. Only persons qualified to use firearms will have keys to the cabinet.

Military installations require the approval of their security forces before allowing a firearm to be brought onto a military installation. In addition to base requirements, some clients (e.g. AFCEE) may require their approval. The PM must determine with sufficient lead-time whether firearm protection of employees from wild animals will be required. If such is determined to be necessary, the PM must submit a request for authorization to the EHS Manager with sufficient lead-time to permit training and other steps required prior to departure for the field.

All firearms and firearm-carrying personnel shall be registered and approved by the EHS Manager in accordance with the project exemption. Copies of the approved exemption will be maintained in the supporting office. Incomplete requests for exemption will be returned to the project manager without action; therefore, thorough planning at the project level is required to ensure that the project schedule is not impacted.

APPROPRIATE FIREARMS

Advantages and disadvantages of the firearms are discussed in Attachment 1. Firearms that are appropriate for protection against large animals include:

- A .30 caliber-magnum ("300 magnum") or larger rifle, or
- A 12-gauge shotgun with rifled slugs.
- Other firearms, such as large bore handguns, will be considered on their individual merits.

AMMUNITION

The type of ammunition to be used is best determined through consultation with local fish and game agencies or professional guide services.

- The number of rounds and type of ammunition brought to job sites shall be registered with the on-site SSO.
- When not in use, ammunition and firearms will be effectively secured/locked up in a vehicle, cabinet, etc.

PROTECTIVE MEASURES OF LAST RESORT

When non-lethal methods of deterrence have been used and / or immediate danger to an individual exists, the wild animal may have to be killed. During project planning consult local provisions of the Defense of Life or Property Regulation in your state. In Alaska, refer to 5 AAC 92.410. After contacting the appropriate fish and game agency, the SSO must submit an incident report to the Division EHS Manager. The individual who shot the animal will make the report. In the state of Alaska, the head and the hide must be salvaged and delivered the Alaska Department of Fish and Game.

VEHICLE SAFETY

Use extreme caution, particularly in darkness, when operating vehicles in areas where wild animals may be present. Collisions with large animals have been known to cause significant property damage and personal injuries to vehicle passengers, including fatalities.

ATTACHMENT 1

BEAR SAFETY – HAZARD RECOGNITION AND PRECAUTIONS

On occasion fieldwork may be conducted in a location where bears may be encountered. The following technical information, precautions, and guidelines for operations in which bears could be encountered is based on experience and conditions for field work in the state of Alaska. Bears are intelligent, wild animals and are potentially dangerous, and would rather be left alone. The more bears are understood the less they will be feared. This attachment is intended to provide information that will enable Weston to plan for bear encounters and to properly address face-to-face encounters.

Bear Life History

Although bears are creatures of habit, they are also intelligent, and each has its own personality. The way a bear reacts is often dictated by what it has learned from its mother, the experience it has had on its own, and the instincts nature has provided. Like other intelligent animals, we can make general statements about bears, but few people can accurately predict their behavior.

Bears have an incredible sense of smell, and seem to trust it more than any other sense. Hearing and sight are also important, but to a lesser degree. A bear's hearing is probably better than ours, but not as keen as a dog's hearing. Their sight is probably comparable to that of a human. Both black and brown bears have similar life styles, although they do not usually get along with each other. Where both species occur in the same area, black bears tend to favor forested habitats while brown bears favor open areas. Since the likelihood of encountering a polar bear is remote, this procedure addresses only black and brown bears. If the project site is in an area where polar bear encounters are a possibility, consult the fish and game department for assistance in planning for encounters.

Bears are opportunists, relying on their intelligence and their senses to find food. They use different habitats throughout the year, depending on the availability of food and other necessities. The area a bear covers in a given year is partially dependent on how far it has to go to satisfy these basic needs. In some areas, individual bears have home ranges of less than a square mile; in other areas ranges can encompass hundreds of square miles. Males usually range over larger areas than females.

In spring, bears begin coming out of hibernation. Males are usually the first bears to emerge, usually in April, and females with new cubs are usually the last, sometimes as late as late June. When bears emerge from their dens, they are lethargic for the first few days, frequently sleeping near their dens and not eating. When they do start eating, they seek carrion (dead moose, caribou, sea mammals, deer, etc.), roots, and emerging vegetation. In coastal areas, beaches become travel corridors as bears seek these foods. In early summer, bears eat new grasses and forage as they develop in higher elevations. Moose and caribou calves are also important foods where they are available. In coastal areas, salmon are the most important food from June through September. This period is one of the few times that bears are found in large groups, and it is the time that most people see bears. Bears often travel, eat, and sleep along streams for weeks at a time.

Other summer foods for bears include salmonberries, grasses, forbs, ground squirrels, and occasionally, adult moose and caribou. When bears kill or scavenge large prey, they commonly cover the portions they cannot eat with sticks and duff. A bear may remain near a food cache for days and it will defend it from intruders.

During the late summer and early fall, bears move inland and consume large amounts of blueberries, elderberries, soapberries, and other succulent fruits. As the seasons progress towards winter, a bear's diet becomes more varied. This is the time that bears are adding final deposits of fat before their long winter naps.

In October and November, bears move into their denning areas and begin preparing a suitable den. Black bears usually den in holes under large trees or rock outcrops, or in small natural cavities. Brown bears usually dig their dens in steep alpine areas. Dens are just large enough for the bears to squeeze into. Bears rarely eat, drink, urinate, or defecate while they are denning. They sleep deeply, but do not truly hibernate, and they can be awakened by loud noises or disturbances.

Cubs are born in the den, usually in January. Black bear cubs usually stay with their mothers for a year and a half, and brown bear cubs usually stay with their mothers for 2.5 to 3.5 years. Black bears are sexually mature at age 2 and brown bears are sexually mature at age 4 – 8. Mating season is in the spring (May or June) and both species are polygamous (multiple mates). Both black and brown bears can live for 25 – 30 years, although most live less than 20 years.

BEAR AND HUMAN INTERACTIONS

Bears generally prefer to be left alone, but they share their homes with other creatures, including humans, who intrude on virtually every aspect of the bear's life. Bears are normally tolerant of these activities and generally find a secure way to avoid them. Humans can help bears make a graceful retreat and avoid many close encounters by letting them know we are coming. Walking in groups, talking, and wearing noise making devices, such as bear bells, all serve to warn a bear of your approach. When possible, avoid hiking and camping in areas where bears are common, such as bear trails through heavy brush or along salmon streams. Always keep an eye out for bears and bear signs. If you happen upon a dead animal, especially one that is covered with sticks and duff (a bear cache), immediately retreat the way you came, but do not run, and make a detour around the area. If you see a cub up a tree or a small bear walking alone, immediately retreat and detour around the area. Like all young animals, cubs wander away from their mothers, but females are furiously protective when they believe their cubs are threatened. Even if we do everything possible to avoid meeting a bear, sometimes bears come to us.

Bears are both intelligent and opportunistic, and they express these qualities through their curiosity. This curiosity frequently brings them into "human habitat." When this happens, we often feel vulnerable, and the bear is sometimes viewed as a threat or nuisance. In most cases, a curious bear will investigate a "human sign," perhaps test it out (chew on a raft, bite into some cans, etc.), and leave, never to return. If the bear was rewarded during his investigation by finding something to eat, it is hard to stop them from returning once they have had a food-reward. That is why we emphasize the importance of keeping

human food and garbage away from bears. When in bear country, always think about the way you store, cook, and dispose of your food. **Never feed bears!** This is both illegal and foolish. Food should be stored in airtight containers, preferably away from living and sleeping areas. Garbage should be thoroughly incinerated as soon as possible. Fish and game should be cleaned well away from camp, and clothing that smells of fish and game should be stored away from sleeping areas. Menstruating women should take extra precautions to keep themselves as clean as possible, and soiled tampons and pads should be treated as another form of organic garbage. Once a bear has obtained food from people, it may continue to frequent areas occupied by people. If a bear does not find food or garbage after the next few tries, it may give up and move back into a more natural feeding pattern. Occasionally, though, the bear will continue to seek human foods and can become a "problem bear." Some bears become bold enough to raid campsites and break into cabins to search for human food. Shooting bears in the rump with cracker shells, flares, rubber bullets, and birdshot are common methods of "aversive conditioning." These are also very dangerous techniques, because they may seriously injure a bear if not done properly and/or they may cause a bear to attack the shooter.

TYPES OF BEARS

The three most prevalent species of bears are the black bear, the brown (grizzly) bear, and the polar bear. Each has a different life-style and somewhat different behavior pattern.

Black Bear Identification: Black bears are the smallest and most abundant of the bear species in Alaska. They are five to six feet long and stand about two to three feet high at the shoulders. They weigh from 200 to 500 pounds. While they are most commonly black, other color phases include brown (cinnamon), and, rarely, gray (blue), and white. Muzzles are usually brown. Black bears can be distinguished from brown bears by:

- Their head shape (a black bear's nose is straight in profile, a brown bear's is dished);
- Their claws (black bear's claws are curved and smaller, brown bears are relatively straight and longer);
- Their body shape (when standing, a black bear's rump seems to be higher than its shoulders; a brown bear's shoulders are usually higher than its rump); and
- By their ears (a black bear's ears are more prominent than a brown bear's ears). Range in Alaska Black bears live throughout Alaska, except on Kodiak Islands, the Alaska Peninsula, some islands, and the extreme northern and western portion of the state.

Typical Habitat: Black bears occupy a wide range of habitats, but seem to be most common in forested areas. Black bears are not uncommon in and around human settlements in Alaska.

Brown Bear Identification: Brown and grizzly bears are the same species. They can be over eight feet long and stand five feet high at the shoulder. Weights are typically 600 to 800 pounds, but can reach 1500 pounds. Colors range from blonde to dark brown. Coastal bears (referred to as brown bears) are the largest land carnivores and are usually medium-to-dark brown in color. Interior bears (referred to as grizzly bears) are smaller

and usually have light tips on their hair, giving them a grizzled appearance. A brown bear's muzzle is the same color as its body. Cubs frequently have a white collar around their neck and shoulders. The dished-face and large shoulder hump are distinguishing features of the brown bear.

Range in Alaska: Brown bears live throughout Alaska, except for the southern portion of the panhandle in southeastern Alaska, and on the Aleutians, and some other islands. Biologists estimate that there are from 30,000 and 45,000 brown bears in the state, and in most areas the numbers are stable. Highest densities occur on Admiralty Island, the Kodiak Islands, and the Alaska Peninsula.

Typical Habitat: Brown bears can, and do, use virtually every type of habitat. Although they are less common around human settlements than black bears, brown bears can live in close proximity to people. Polar Bear Identification

Polar Bear Identification: Polar bears are about the same size as coastal brown bears.

Colors range from white to yellow. Black nose is prominent. Head shape is similar to that of a black bear, but their long tapering necks make polar bears' heads appear to be small in relation to their body size.

Range in Alaska: Polar bears are found in coastal Alaska and offshore waters from Bristol Bay to the Arctic. Ice conditions dictate local polar bear abundance.

Typical Habitat: Islands, coastlines, and waters near pack ice and ice floes, rarely occurring far inland, except for denning females, are typical habitat.

AVOIDING BEAR ENCOUNTERS WHEN

- The Bear sees you but you do not know the bear is around: The bear will likely avoid detection people and will simply move away when they sense a human.
- You see a bear and it does not know you are there: Move away slowly. Avoid intercepting the bear if it is walking. If possible, detour around the bear. If the bear is close to you, stand where you are or back away slowly. Do not act threateningly toward the bear, it may know you are there but it has chosen to ignore you as long as you are not a threat.
- You see the bear and the bear sees you: Do not act threateningly, but let the bear know you are human. Wave your arms slowly, talk in a calm voice, and walk away slowly in a lateral direction, keeping an eye on the bear. Unless you are very close to a car or a building, never run from bears. In a bear's world, when something runs it is an open invitation to chase it. Bears will chase a running object even if they have no previous intention of catching it. Bears can run as fast as a racehorse, so humans have little or no chance of outrunning a bear.
- You see a bear; the bear sees you and stands on its hind legs: This means that the bear is seeking more information. Bears stand on their hind legs to get a better look, or smell, at something they are uncertain of. It is your cue to help it figure out what you are. Help the bear by waving your arms slowly and talking to it. Standing is not a precursor to an attack. Bears do not attack on their hind legs. It is also important to remember that when a bear goes back down on all fours from a standing position, it may come towards you a few steps. This is normal, and probably not an aggressive act.

- The bear sees you, recognizes you as a human, but continues to come towards you slowly: This may mean several things, depending on the bear and the situation. It may mean that the bear does not see you as a threat, and just wants to get by you (especially if the bear is used to humans, as in a National Park); the bear wants to get food from you (if it has gotten food from people before); the bear wants to test your dominance (it views you as another bear); or may be stalking you as food (more common with black bear, but a rare occurrence). In all cases, your reaction should be to back off the trail very slowly, stand abreast if you are in a group, talk loudly, and/or use a noise-making device. If the bear continues to advance, you should stop. At this point, it is important to give the bear the message that if he continues to advance it will cost him. Continue to make loud noises and present a large visual image to the bear (standing abreast, open your coat). In bear language, bears assert themselves by showing their size. If an adult brown bear continues to come at you, climbing 20 feet or higher up a tree may also be an option if one is next to you (remember, never run from bears). Keep in mind, though, brown bear cubs and black bears can climb trees, and adult brown bears can reach 10 – 15 feet.
- The bear recognizes you as a human and acts nervous or aggressive: When bears are nervous or stressed they can be extremely dangerous. This is when it is important to try to understand what is going on in the bears mind. Nervous bears growl, woof, make popping sounds with their teeth, rock back and forth on their front legs, and often stand sideways to their opponent. A universal sign of a nervous bear is excessive salivation (sometimes it looks like they have white lips). When a bear shows any of these signs, stand where you are and talk in a calm voice. Do not try to imitate bear sounds, this may only serve to confuse and further agitate the bear. If you are in a group, stand abreast. If you have a firearm available, be prepared to use it.
- The bear charges: If all other signals fail, a bear will charge. Surprisingly, most bear charges are just another form of their language. The majority of these are “bluff charges,” that is; the bear stops before making contact with their opponent. There are many different types of bluff charges ranging from a loping uncertain gait to a full-blown charge. If a bear charges, stand still. If you have a firearm, take appropriate action, but remember, if a bear is wounded, a bluff charge may immediately turn into a real charge as the bear’s mind shifts from an offensive mode to a defensive mode.
- The bear attacks: When all else fails, a bear may attack. Attacks may be preceded by all of the behaviors previously described or they may be sudden. Seemingly unprovoked attacks are often the result of a bear being surprised (and feeling threatened), a bear defending its food cache, or a female defending her cubs. When a bear attacks, it typically runs with its body low to the ground, legs are stiff, ears are flattened, hair on the nape of the neck is up, and the bear moves in a fast, determined way. Front paws are often used to knock the opponent down and jaws are used to subdue it.

AFTER A BEAR ENCOUNTER

If a bear attacks you, your reaction depends on the type of bear that is attacking. If it is a black bear, fight vigorously, for your life may depend on it. Black bears have been known to view humans as prey, and if you struggle with the attacking black bear, it will probably go elsewhere for its meal.

Brown bears are a completely different story. Brown bears attack because they feel threatened, and they will continue to press the attack until the threat has been neutralized. If you fight and struggle, the bear will continue to fight, and a human has little or no chance to defeat a brown bear in battle. Lie on your face and stomach, place your hands behind your neck, and lie still when you are attacked. A brown bear will no longer see you as a threat and may stop the attack. Although it sounds foolish to play dead while being attacked by a bear, this has been proven to be the best way to survive a brown bear attack. It should be noted that if you fall down and play dead before a bear actually makes contact, the bear might come over to determine what is going on. Actual maulings by bears are very rare. Alaska has more bears than anywhere else in the world, and there are hundreds of thousands of people living, working, and playing in these bears' back yard. Yet, since 1900, there have only been an average of about two people per year mauled by bears in the state, and very few of those instances have resulted in death.

As a last resort, a bear may have to be shot. When this is the only option, it will likely be in a situation that has a sudden onset. Therefore, it is important that you are familiar and comfortable with whatever firearm you decide to carry. Remember that if you wound a bear, you make the situation worse. There is an on-going debate as to what is the best firearm to use for protection from bears. The following are a few of the pros and cons for some of the more popular firearms:

- **Pistols:** Convenient to carry, always with the person, can be used in close quarters during an attack, rapid-fire is possible. However, are dangerous to humans (accidents), much practice is needed to be proficient; may not be powerful enough to stop a large bear.
- **Shotguns:** Can be loaded with a variety of projectiles, effective at close range in brushy situations, rapid-fire is possible, easy to use. They are however inaccurate and ineffective at medium to long range, heavy to carry, potentially dangerous to humans, may not be powerful enough to stop a large bear.
- **Rifles:** Very powerful calibers are available, accurate at both close and long range. However, practice is required for accuracy in an emergency, range of bullet makes it dangerous to humans, heavy and awkward to carry, rapid fire is difficult with bolt action rifles.

There are different thoughts as to the best place to shoot a charging bear. In reality, a person usually has little time to contemplate shot placement in a true bear attack. If you have a choice, it is best to aim at the shoulder and chest area. Bear's skulls are thick and covered with large muscles, so headshots may not be effective. Once you have made the decision to shoot a bear, you have a responsibility to finish the job you have started. Keep firing until you are out of bullets or you are positive the bear is dead. A wounded bear can be dangerous to you and anyone else who comes into the area.

- Bear Sprays: Are easy to carry and use, little risk of permanent damage to bears and humans, effective in many situations. However, using a spray may change a false charge into a real charge, they are ineffective at ranges greater than 20 feet, ineffective in windy conditions, dangerous if accidentally discharged in a closed area such as an aircraft cockpit.

Regardless of the firearm you choose, it is imperative that you realize that the most effective tool you have against an attacking bear is your brain. Although bears are intelligent animals, we are smarter and can often think our way out of a bad situation if we try. We must never let the firearm we carry become a replacement for common sense.

LAWS CONCERNING BEAR/HUMAN INTERACTIONS IN ALASKA

There are two regulations governing bear and human interactions in Alaska. The first, ACC 92.230, prohibits feeding bears or leaving garbage that attracts them. The other, 5 ACC 92.410, sets guidelines for taking a bear in defense of your life or property (DLP). These DLP provisions specifically state that a bear cannot be killed legally if the problem is caused by the improper disposal of garbage or some other attractive nuisance, or if it is brought about by harassment or provocation of the animal or an unreasonable invasion of its habitat.

The regulation also defines what is considered "property." If a bear is killed under the DLP provisions, the hide and skull are the property of the state and must be turned over to Fish and Game as soon as possible. The person who shot the bear is also required to submit a written incident report within 15 days. (Obtain a paper copy of this attachment through Corporate Health, Safety, and Environment.).

ATTACHMENT 2

HAZARDS AND PRECAUTIONS – MOOSE, ELK, AND DEER

On occasion fieldwork may be conducted in a location where moose may be encountered. The following technical information, precautions, and guidelines for operations in which Moose, Elk, or Deer may be encountered is based on experience and conditions for field work in the state of Alaska. The more these species are understood, the easier it will be to avoid contact with them thus preventing injury to ourselves and to the animals. All big game species are unpredictable and can be dangerous under certain conditions. This attachment is intended to provide information that will enable Weston to plan for encounters and to properly address face-to-face encounters.

MOOSE

Moose are the world's largest members of the deer family. The Alaska race is the largest of all the moose. Moose are generally associated with northern forest in North America, Europe, and Russia. In Alaska, they occur in suitable habitat from the Stikine River in the Panhandle to the Colville River on the Arctic Slope, and as far south on the Alaska Peninsula as Herendeen bay. They are most abundant in recently burned areas that contain willow and birch shrubs, on timberline plateaus, and along the major rivers of South-central and interior Alaska. General Description

Moose are long-legged and heavy-bodied with a drooping nose, with a "bell" or dewlap under the chin, and a small tail. Their color ranges from golden brown to almost black, depending on the season and the age of the animal. The hair of newborn calves is generally red-brown, fading to a lighter rust color within a few weeks. Newborn calves weigh 28 to 35 pounds and within five months grow to over 300 pounds. Males in prime condition weigh from 1,200 to 1,600 pounds. Adult females weigh 800 to 1,300 pounds. Only the bull has antlers.

Life History: Cow moose generally breed at 28 months, though some may breed as young as 16 months. Calves are born anytime from mid-May to early June. Cows give birth to twins 15 to 75 percent of the time, and triplets may occur once in every 1,000 births. The incidence of twinning is directly related to range conditions. A cow moose defends her newborn calf vigorously. Calves begin taking solid food a few days after birth. They are weaned in the fall at the time the mother is breeding again. The maternal bond is generally maintained until calves are 12 months old at which time the mother aggressively chases her offspring from the immediate area just before she gives birth. By late October, adult males have exhausted their summer accumulation of fat and their desire for female company. Once again, they begin feeding. Antlers are shed as early as November, but mostly in December and January.

Food Habits: During fall and winter, moose consume large quantities of willow, birch, and aspen twigs. In some areas, moose actually establish a "hedge" or browse line six to eight feet above the ground by clipping most of the terminal shoots of favored food species. Spring is the time of grazing as well as browsing. Horsetail, pond weeds, and grasses. During summer, moose feed on vegetation in shallow ponds, forbs, and leaves of birch, willow, and aspen.

Movement: Most moose make seasonal movements to calving, rutting, and wintering areas. They travel from only a few miles to as many as 60 miles during these transitions.

WORKING SAFELY AROUND MOOSE

Every year someone is injured by a moose and in some cases fatalities are caused by moose attacks. Most cases of moose attack are from cows defending their calves and they are well equipped to do so. Cow moose attack with their front feet and sharp hooves; they can kill wolves and in some cases drive grizzly bears away from their offspring. Bull moose attack with their massive antlers and can do great damage in a short amount of time. One should always be alert when working in moose country. If you encounter a moose, never approach too closely. Moose will generally declare their displeasure of your presence by lowering their ears and raising their hackles (the long hair on their neck and back). Immediately retreat if you see a moose displaying this behavior. If you are about to be attacked by a moose and there are trees present, stay behind the tree. A human can move around a tree faster than a moose can. Use common sense. Avoid contact with any wild animal. Most have the ability injure a human. Never play dead if attacked by a moose. Put something substantial between you and the moose.

ROOSEVELT ELK

Roosevelt Elk are larger, slightly darker in color, and have shorter, less symmetrical yet more massive antlers than the Rocky Mountain Elk found east of the Cascade Mountains in Canada and the United States.

General Description: Elk are members of the deer family and share many physical traits with deer, moose, and caribou. They are much larger than deer, but not as large as moose, which occur in Alaska. Distinguishing features include a large yellowish rump patch, a grayish to brownish body, and dark brown legs and neck. Unlike some members of the deer family, both sexes have upper canine teeth. The males have antlers, which in prime bull are very large, sweeping gracefully back over the shoulders with spikes pointing forward. Alaska elk antlers have a tendency toward crowning, the formation of the three points at the end of each antler. Elk shed their antlers during the winter each year and grow new ones the following summer. The soft growing antler is covered with velvet, which is scraped off by rubbing and jousting after the antlers harden in the fall. Bull elk on Afognak Island are estimated to weigh up to 1,300 pounds. Cow elk are similar in appearance to the bulls, but are smaller and have no antlers.

Life History: Elk calves are born in late May or early June when abundant food is available for the mother and the mild weather increases the calves' chances for survival. Birth usually occurs under the cover of dense spruce forest, hidden from predators and protected from the elements. Calves are born with protective coloration (light spotted areas on the back, which act as camouflage). A few days after giving birth, the mother joins other cow elk with calves. A single cow will often "baby-sit" with the calves while the remaining cows seek food. As summer progresses, elk bands move above timberline and feed on the alpine slopes where breezes keep biting insects at bay and young plants are highly nutritious. By July, the calves, although still nursing, begin feeding on succulent forbs.

Beginning in August, bands of elk congregate and form herds consisting of cows, calves, yearlings, and an occasional mature bull. Nearby, but separate from the heard mature bulls can be found. During September, the bulls join the main herds and mating activities (the rut) begin. Large herds are scenes of vigorous activity as mature bull challenge each other vocally, emitting a high-pitched whistle or bugle, an eerie but thrilling sound. Occasionally, pushing and shoving matches are initiated as the mature bull attempt to take advantage of the larger bull's preoccupation and run past them to win the favors of a female. By mid-October most breeding activities have ceased. Herds may begin to disperse into smaller bands as they move into wintering areas. Winter months are spent in lower valleys and in the dense spruce forest and small openings near the coastline searching for food.

Food: Elk are hardy animals whose large body size and herding tendencies require tremendous amounts of food. From late spring to early fall, with a wide variety of food available, elk are mainly grazers, using grasses, forbs, and other leafy vegetation. By late fall they become browsers, feeding on sprouts and branches of shrubs and trees.

Population: From the original eight transplanted animals, Afognak elk have expanded to about 1,200.

WORKING SAFELY AROUND ELK

Although elk are not as widely distributed as moose in Alaska, they are large and potentially dangerous when the bulls are in the rut and when you may be near cows with young calves. Follow the same precautions as set forth above for moose. Elk bulls have a tendency to be more aggressive during the rut (September & October) than either moose or deer, and caution should be used when working near bulls during this time of year. Aggressive cows with calves should be avoided as well, since they attack in the same manner as cow moose.

SITKA BLACK-TAILED DEER, MULE DEER, AND WHITE-TAILED DEER

The Sitka black-tailed deer is native to the wet coastal rain forest of Southeast Alaska and north coastal British Columbia. Transplants have expanded its range and established population now also exist near Yakutat, in Prince William Sound, as well as Kodiak, and Afognak, and Raspberry Islands.

General Description: The Sitka black tailed deer is smaller, stockier, and has a shorter face than other members of the black-tailed group. Fawns are born in early June and weigh six to eight pounds at birth. The average October live weight of adults is about 80 pounds for does and 120 pounds for bucks, although dressed weight bucks of over 200 pounds have been reported. The summer coat of reddish brown is replaced by dark brownish gray in winter. Antlers are dark brown with typical black tailed branching. Normal adult antler development is three points on each side. Average life span is about 10 years, but a few are known to have attained an age of at least 15.

Life History: Fawns are born in late spring. After the winter snow pack recedes, deer disperse; migratory deer move to high elevation alpine/sub-alpine habitats while resident deer remain at lower elevations throughout the forest. Summer and early fall are periods

of active foraging as deer accumulate fat reserves, which will help them through the winter and early spring. With the first heavy frost, deer in the higher alpine and sub-alpine areas descend to the upper forest. The breeding season (or rut) peaks during late November. Breeding bucks spend little time foraging and by late November have used up much of their fat reserve. Does, however, generally enter December in prime condition. Does breed during their second year of life and continue producing fawns annually until they are 10 or 12 years of age. Reproductive success decreases rapidly beyond 10 to 12 years and by age 15, which is probably the maximum life expectancy, reproduction has essentially ceased. Prime age does (5 to 10 years) typically produce two fawns annually.

Throughout the rest of the winter and early spring, deer are generally restricted to uneven-aged old growth forest below 1,500 feet in elevation. The old growth forest provides optimal winter habitat because the high broken canopy intercept much snow but still provides enough light for the growth of forage plants used by deer. During winter, the distribution of deer at various elevations is influenced by changing snow depth. During extreme snow accumulations, many deer congregate in heavily timbered stands at lower elevations, and some may even move into the beach. Spring is a critical period for deer, and if winters are deep and persistent, many deer die of starvation. As snow melts in mid to late spring, deer begin to disperse, and by late spring and early summer they start rebuilding some of the fat reserves lost during winter.

Home Range: Summer and winter home range areas vary from 30 to 1,200 acres and average about 200 acres for radio-collared deer on Admiralty Island. Migratory deer have larger annual home ranges than resident deer. The average distance between summer and winter home ranges is five miles for migratory deer and half a mile for resident deer. Movement of deer between watersheds appears to be minimal during winter.

Food Habits: During summer, deer generally feed on herbaceous vegetation and the green leaves of shrubs. During winter, they are restricted to evergreen forbs and woody browse. When snow is not a problem, evergreen forbs such as bunchberry and trailing bramble are preferred. During periods of deep snow, woody browse such as blueberry, yellow cedar and hemlock, and arboreal lichens are used. Woody browse alone, however, is not an adequate diet and deer rapidly deplete their energy reserves when restricted to such forage.

Populations: Deer populations in Alaska are dynamic and fluctuate considerably with the severity of the winters. When winters are mild, deer numbers generally increase. Periodically, however, a severe winter will cause a major decline in the population. Deer have a high reproductive potential, and depressed populations normally recover rapidly. In some cases, however, predation may speed deer decline, as well as slow recovery to higher levels. The wolf, which occurs on the mainland and islands south of Frederick Sound, is considered the major predator of deer in Southeast Alaska. Both black and brown bears also prey on deer to some degree.

WORKING SAFELY AROUND DEER

The White-tailed deer found throughout the eastern and western part of the United States have been known to attack people on many occasions. It is unknown whether Black-tailed deer have made any such attacks, but it is possible for someone to be injured by an irate buck in the breeding season (late fall). Deer are well equipped to injure humans. They are very fast. Bucks have sharp antlers and can clear amazingly high obstacles with graceful, arching leaps. They can run with remarkable speed, even in dense cover, and have excellent camouflage. When working in areas populated with deer, whether it be White-tailed, Black-tailed, or Mule deer, it is just common sense not to approach any large wild animal too closely. It is unlikely that an attack from a deer would be fatal but it is possible and serious injury is likely.

ATTACHMENT 3

AMERICAN BISON AND FERAL WILD CATTLE – HAZARD RECOGNITION AND PRECAUTIONS

American Bison (Bison), which shaped the lifestyle of the plains Indians and figured prominently in American history before they were brought to near extinction, were transplanted to Alaska from Montana in 1928. While bison were the most common large land mammal in Alaska thousands of years ago, all of Alaska's wild bison came from 20 animals released near Delta Junction. Natural emigration and transplants have now created additional herds at Copper River, Chitina River, and Farewell. Small domestic herds are located at Healy, Kodiak Island, and on Provo Island. There were approximately 700 wild bison in the state in mid-1985.

General Description: The bison is the largest native land mammal in North America. A full-grown bull stands six feet at the shoulder, is up to 10 feet long, and can weigh more than a ton. Full-grown cows are smaller, but have been known to weigh over 1,200 pounds. A bison's head and forequarters are massive and seem out of proportion to the smaller hind parts. Bison have vertebrae, which begins just ahead of the hips and reaches its maximum height above the front shoulder. From above the shoulder, the hump drops almost straight down to the neck. The bison's horns curve upward. The horns of the bull are larger and heavier than the horns of the cow. As winter progresses, their coats change color and are much paler by spring. When the weather warms, the hair loosens and hangs in patches until it is completely shed and replaced with new hair by late spring. Hair on the chin resembles a goatee. Older animals tend to have more hair on their heads.

Life History: Most bison young are born in May, but calves are born from April to August or even later. Newly born calves have a reddish coat. They are able to stand when only 30 minutes old; within three hours of birth, they can run and kick their hind legs in the air. At about 6 days of age, calves start grazing. Their reddish-orange coat begins to darken at about 10 weeks, with the molt to dark brown complete about five weeks later. Cows are sexually mature at two years of age and give birth to single calves twice in three years. The gestation period is approximately 270 days. On rare occasions, a mostly white or even albino calf has been born in the Delta herd, but none has reached maturity. Bison in Alaska have been known to live to a relatively great age compared to other hoofed animals (ungulates). One tagged bull killed in the Copper River area was over 20 years old. Bison are migratory animals by nature. Alaska's wild bison do not remain in single herds, but scatter alone or in-groups ranging up to 50 animals or more. In the Delta Junction area, they move far up the Delta River in early spring to secluded meadows where they calve. Around August they travel back downstream, eventually moving on the Delta Junction Bison Range, and finally in late fall, onto farms where they remain throughout the winter. Here they sometimes cause damage to un-harvested crops. Alaska's other wild bison herds also have seasonal movement patterns. Bison move slowly while feeding and appear to be quite clumsy. This is pure deception, for when pursued, the bison is fleet of foot and has great endurance. A mature bull eventually captured at Delta Junction jumped a seven-foot log fence from a standing position.

Food Habits: Bison are grazing animals and in Alaska find only limited amounts of food along rivers, in recent burns, and sedge potholes. Their diet is made up mainly of various grasses and forbs like vetch, a favored summer food found on gravel bars. Sedges, silverberry, willow, and ground birch are also eaten.

Working Safely Around Bison: When working in areas where bison are present, follow the same precautions as stated above for other large potentially dangerous wild animal. Generally, where bison are present there also will be moose and Brown (Grizzly) bears sharing the same area. Partially due to the relatively sparse population, bison injure fewer people than Brown Bears or moose. Never approach bison and use caution when working near bison as they are unpredictable and can cover a lot of ground in a short amount of time. Bison can be found in timbered areas. If approached by a bison and you cannot make it to a vehicle, keep a large tree between you and the bison. You can move around the tree faster than the bison. If a single bison or heard of bison approach you or your crew, retreat to your vehicle and leave the area. Do not attempt to “drive” the bison from your area while in your vehicle. Bison have no respect for cars and could charge and damage your vehicle and the occupants. The best way to avoid contact is to use your head and give the bison the right of way.

FERAL OR WILD CATTLE

Feral or wild cattle are only found in a few remote locations in Alaska. A population exists on Sitkinak Island on the south end of Kodiak Island, Long Island, Harvester Island, and Chirikof Island. The same caution should be used when working in areas with a population of wild cattle that would be used when working around any of Alaska’s dangerous wildlife. Never approach too closely and if they begin to approach you, clear the area as fast as possible. If you arrive at your work site and there are wild cattle close by, stay in your vehicle and remain there until they leave the area. If it is necessary to destroy a wild cow, you must notify the Department of Fish & Game. The same Defense of Life and Property (DLP) law that applies to big game species does not apply to wild domestic cattle, but you will be required to salvage the meat and make the report. Cattle reside on leased ground, and the owner of the leases must also be notified. It may also be necessary to compensate the landowner.

Wild Feral Cattle can be dangerous, and there are reports of injuries to people. Although they may look domestic cattle, they are wild and have no fear or respect for humans. Give them the right of way, use common sense, and maintain a safe distance when working where wild Feral Cattle inhabit the area.

ATTACHMENT 4

MOUNTAIN LIONS (COUGARS) – HAZARD RECOGNITION AND PRECAUTIONS

Mountain lions range throughout the Western United States and are the largest cat in North America, weighing considerably more than its cousins — the lynx, bobcat and domestic cat. Sleek and graceful, the cougar is a solitary and secretive animal rarely seen in the wild. However, in many areas humans are encroaching on wildlife habitat and cougar numbers are rebounding, the number of cougar sightings in suburban areas is on the rise

COUGAR COUNTRY

Cougars prefer rocky terrain, dense brush and semi-open forests. The other essential ingredient, of course, is deer and elk, the cougar's main prey. Traditionally, cougars were associated almost exclusively with deer and elk herds, but as cougar have expanded their range and adapted to semi-urban areas, smaller mammals like raccoons, coyotes and opossums supplement their diet.

Cougars are territorial animals and maintain home ranges of up to 100 square miles. The lions mark their territories with "scratch hills" or scrapes — leaves, grasses and dirt they rake together into small piles and urinate on. Most active at dawn and dusk, cougars are lone hunters designed for short bursts of speed. They prefer to ambush their prey and often drag their kills to secluded spots where they will eat it and then cover, or cache, the remains for later.

General Description: Cougar, mountain lion, puma, panther, and catamount are common names of this large predator. The cougar is a member of the cat family and have short faces, relatively small rounded ears, and retractable claws. An adult cougar's body length ranges from 42-54 inches with tails nearly 3 feet long (a third of the lion's total length). Adults range from 26-31 inches tall at the shoulder. Adult males can weigh up to 200 pounds, adult females up to 120 pounds. Cougars vary in color from reddish-brown to tawny to gray with a black tip on their tail. Kittens have black spots.

Range/Habitat: Cougars prefer rocky terrain, steep slopes and cliffs, rim rock, dense brush and semi-open forests — essentially the same general range as its prey species, the deer, elk, mountain goat and wild sheep. Over 20,000 cougars are thought to live in the Western United States.

Cougars are primarily crepuscular (active at dawn and dusk) and secretive animals. Adults, particularly the males, roam widely often covering a home range of 75-100 square miles. The lions are territorial and will "mark" their territories by urinating on scratch piles. They den in rock outcroppings, dense thickets and under uprooted trees.

Food: Cougars are carnivores, meaning they eat mainly meat. Their diet consists primarily of deer and elk. Mountain goat, wild sheep, moose, coyotes, porcupine, raccoons, beaver, hares, rodents, and occasionally, domestic animals all supplement their diet. Cougars will cache uneaten portions of their kill or cover it for later consumption, but will not eat spoiled meat, as bears will.

Life span: Cougars 8-12 years are considered old, yet they may live up to 20 years. Cougars breed for the first time between 2 and 3 years of age. They are polygamous, meaning individuals may breed with several different cougars. The bond between male and female is short-lived and the male cougar plays no role in raising the kittens. A female's gestation period is 88-97 days (about 3 months). The animals normally breed every other year and during no particular breeding season. Females usually give birth to two kittens, but litters may range from one to six kittens, and may be born any month of the year. Newborns are 8-12 inches long and weigh less than a pound. Kittens remain with their mother for a year and a half.

COUGARS: CLOSE ENCOUNTERS

Cougar attacks on humans are extremely rare. In North America, fewer than 20 fatalities and 75 non-fatal attacks have been reported during the past 100 years. However, more cougar attacks have been reported in the western United States and Canada over the past 20 years than in the previous 80. In Washington, of the one fatality and five non-fatal attacks reported since 1924, four attacks have occurred during the 1990's. As cougar numbers increase in Washington and habitat dwindles, the more likely you are to encounter a lion. Young, newly independent cougars of 1 or 2 years of age, presumably having difficulty finding food for themselves, account for the majority of the cougar/human interactions reported in Washington.

IN COUGAR COUNTRY (ESPECIALLY WOODED FOOTHILLS):

- Keep pets indoors or in secure kennels at night for safety.
- If practical, bring farm animals into enclosed sheds or barns at night, especially during calving or lambing seasons.
- Do not leave pet food or food scraps outside.
- Store garbage in cans with tight-fitting lids so odors do not attract small mammals.
- When children are playing outdoors, closely supervise them and be sure they are indoors by dusk.
- Light walkways and remove any heavy vegetation or landscaping near the house.
- Avoid feeding wildlife or landscaping with shrubs and plants that deer prefer to eat. Remember, predators follow prey.

While recreating or working in cougar country you can avoid close encounters by taking the following precautions:

- Work or hike in small groups and make enough noise to prevent surprising a cougar. Avoid hiking alone.
- Keep small children close to the group, preferably in plain sight just ahead of you.
- Do not approach dead animals, especially recently killed or partially covered deer and elk.
- Be aware of your surroundings, particularly when hiking in dense cover or when sitting, crouching or lying down. Look for tracks, scratch piles, and partially covered droppings.

- Keep a clean camp. Reduce odors that may attract small mammals like raccoons, which in turn attract cougars. Store meat, other foods, pet food, and garbage in double plastic bags.
- Do not leave your pet tied at a campsite, which may also attract cougars. Better yet, leave “Rover” at home when camping or hiking.

WHEN AN ENCOUNTER OCCURS

If you do come face to face with a cougar, your actions can either help or hinder a quick retreat by the lion. Here are some tips.

- Stop, stand tall and don’t run. Pick up small children immediately. Running and rapid movements may trigger an attack. Remember, a cougar’s instinct is to chase.
- Face the cougar, talk to it firmly and slowly back away. Always leave the animal an escape route.
- Try to appear larger than the cougar by getting above it. (E.g., stepping up onto a stump). If wearing a jacket, hold it open to further increase your size.
- Do not take your eyes off the animal or turn your back. Do not crouch down or try to hide.
- Never approach the animal, especially if it is near a kill or with kittens. Never corner the animal or offer it food.
- If the animal does not flee and shows signs of aggression (crouches with ears back, teeth bared, hissing, tail twitching, and hind feet pumping in preparation to jump), be more assertive. Shout, wave your arms and throw rocks. The idea is to convince the cougar that you are not prey, but a potential danger.

If the cougar attacks, fight back aggressively and try to stay on your feet. Cougars have been driven away by people who have fought back using anything within reach, including sticks, rocks, shovels, backpacks, and clothing — even your bare hands. Generally, if you are aggressive enough, a cougar will flee, realizing it has made a mistake.

ATTACHMENT 5

PROJECT SPECIFIC EXEMPTION FOR FIREARMS

Weston Corporate policy (insert OP#) specifically prohibits firearms on Weston premises or project sites. However, in some remote locations firearms may be necessary to ensure a safe work environment. When the project manager has determined that firearms are necessary the Policy # ____ Project Specific Exemption for Firearms form (attached) must be completed and submitted with the SSHP. The Corporate EHS Manager (or designated representative in his absence) is authorized to grant a project specific exemption.

The project specific exemption applies only to projects where firearms are required and should be omitted when other controls are deemed appropriate. To obtain an exemption, complete the attached form and submit it along with the HSP to the Corporate EHS for approval.

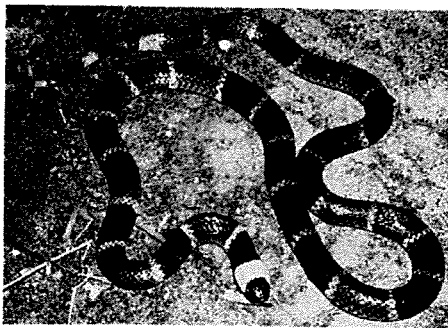
Project Specific Exemption for Firearms				
Project Name:			End Date:	
Location:			Start Date:	
Contract Number:			WO No.:	
Wildlife Species of Concern:				
Project Narrative (Brief description of the scope of work):				
Justification (Brief narrative supporting firearm exemption):				
<p>The following named personnel have demonstrated proficiency in wildlife protection through training and experience (Attach copies of training documents), have voluntarily submitted to a check through the National Criminal Information Computer (NCIC) and have no convictions that prevent them from possessing firearms, have agreed to perform the duties as outlined in the HSP; therefore granted an exemption and permitted to possess firearms on the project site for the express purpose of wildlife protection.</p>				
Employee Name	SSAN	Company	Title	NCIC
				Pass / Fail
				Pass / Fail
				Pass / Fail
				Pass / Fail
<p>This document grants an exception to Roy F. Weston, Inc.'s Policy # ____ and permits firearms on this project for the express purpose of protection from Wildlife. All persons either employed by or subcontracted to Weston must adhere to the requirements for safe handling of firearms and other restrictions as outlined by this Field Operating Procedure ____ and those that may be required by the client, airline companies, and any other concerned agencies or organizations. These restrictions must be stated in the HSP.</p>				
Approvals:				
Title	Name (print or type)	Signature	Date	Approved
Project Manager				Yes / No
OU Manager				Yes / No
Safety Officer				Yes / No
<p>Statement of Compliance: The above persons approving this document have reviewed the requirements of the project and agree that the possession and use of firearms is necessary to ensure that Weston is able to ensure a safe work environment on the stated project. Only those persons named herein shall be permitted to possess firearms.</p>				
Title	Name (print or type)	Signature	Date	Approved
Division EHS Manager				Yes / No
Corporate EHS Manager				Yes / No
The Division and Corporate safety managers have reviewed this request and hereby grant a project specific waiver.				
<p>Approval Comments: (Write comments as appropriate)</p> <p>This exemption does not permit or allow possession of firearms on or in vicinity of, the project location for any purpose other than protection from wildlife.</p>				

APPENDIX B - PICTURES OF POISONOUS SNAKES AND LIZARDZS

Americas

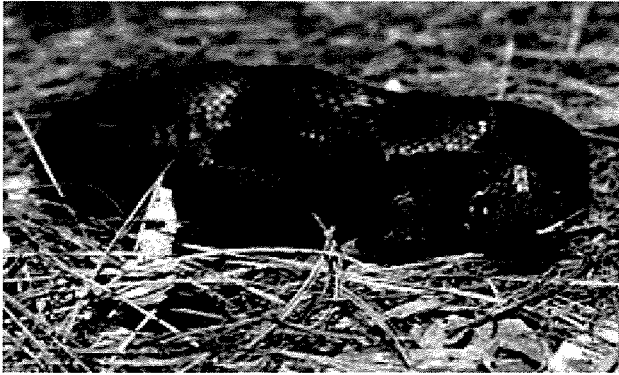


American copperhead

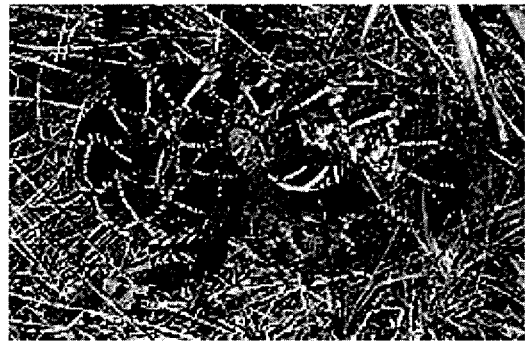


Coral Snakes – Western, Eastern and Texas

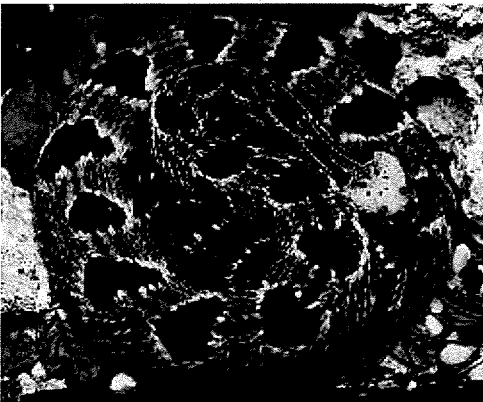
– Southern US



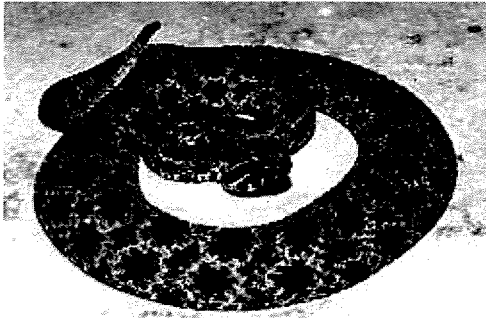
Cotton Mouth – East and Southeast US



Eastern Diamondback Rattlesnake - Southeast US



Timber Rattlesnake – Eastern US



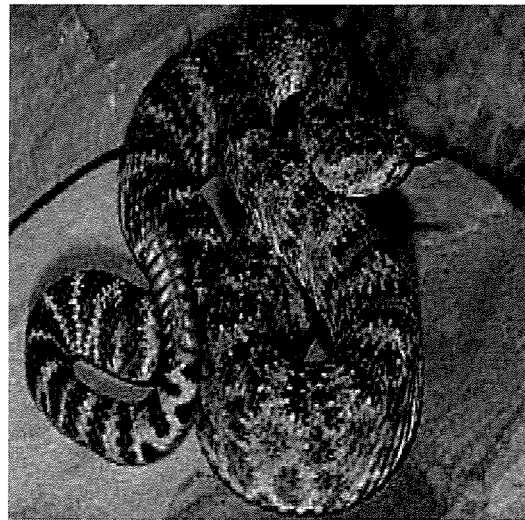
Dusky Pygmy Rattlesnake - SE US



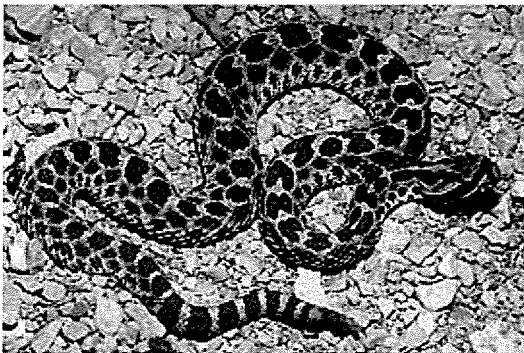
Mojave Rattlesnake – Southwest US Mexico



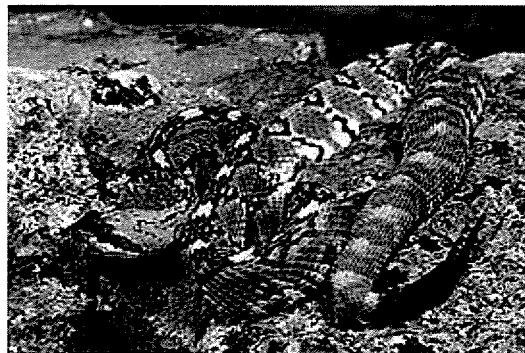
Western Diamondback Rattlesnake – SW US



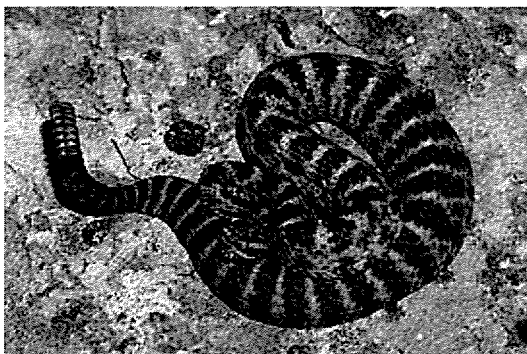
Speckled Rattlesnake - SW US



Massasauga – North and South Central US



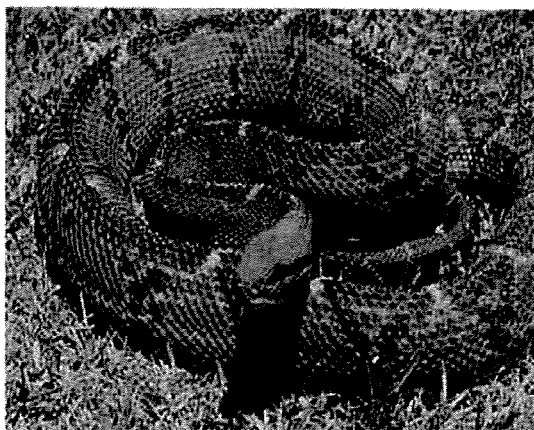
Black-tailed Rattlesnake – South Central US and Mexico



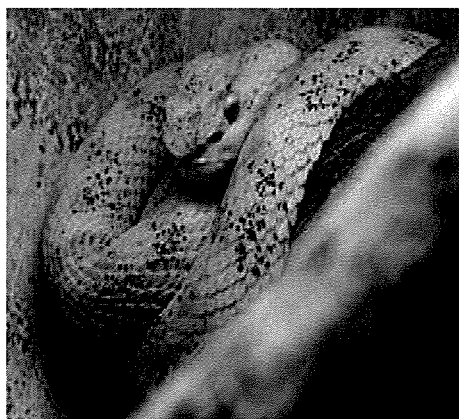
Tiger Rattlesnake – Southwest US and Mexico



Sidewinder – Southwest US



Bush Master – Central and South America, Caribbean



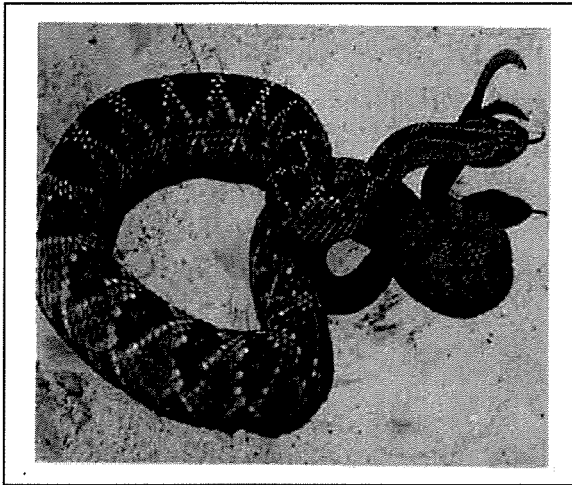
Eyelash Pit Viper



Fer-de-Lance – Central & South America



Jumping Viper – Central America



Tropical rattlesnake - Southern Mexico,
Central America, and South America.

Lizards

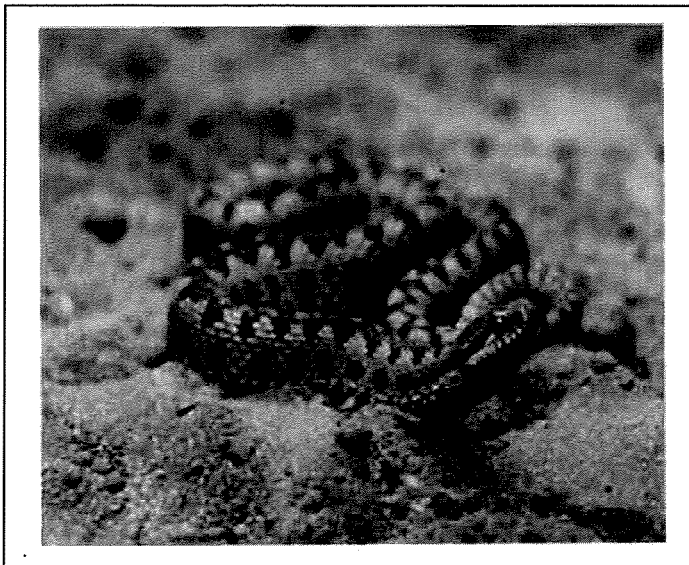


Gila Monster – SW US

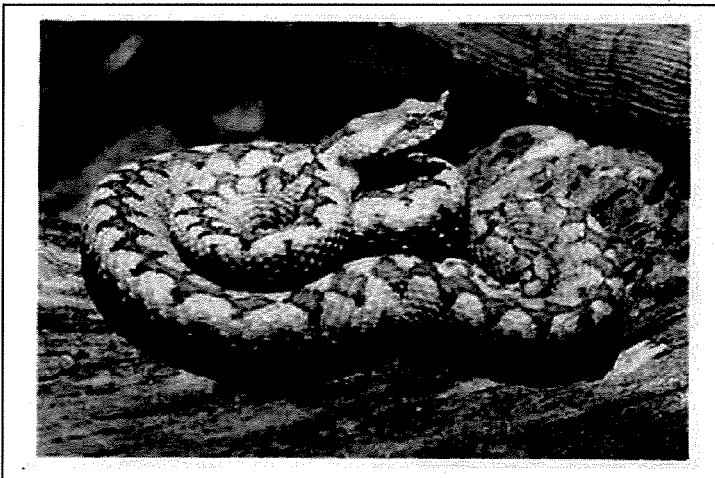


Mexican Bearded Lizard –
Mexico and Central
America

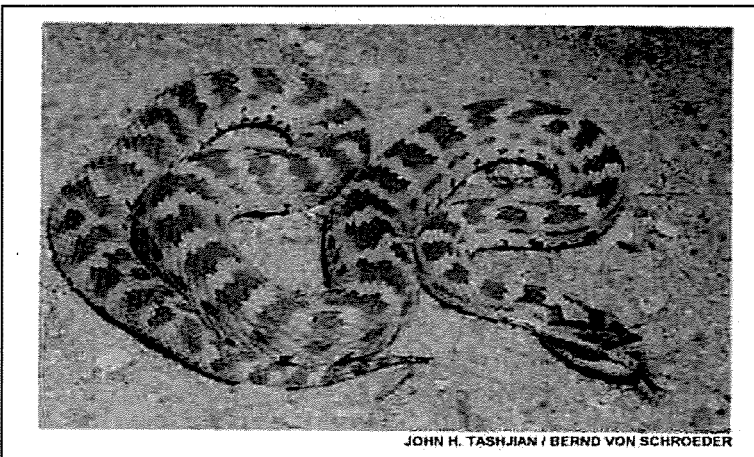
Europe



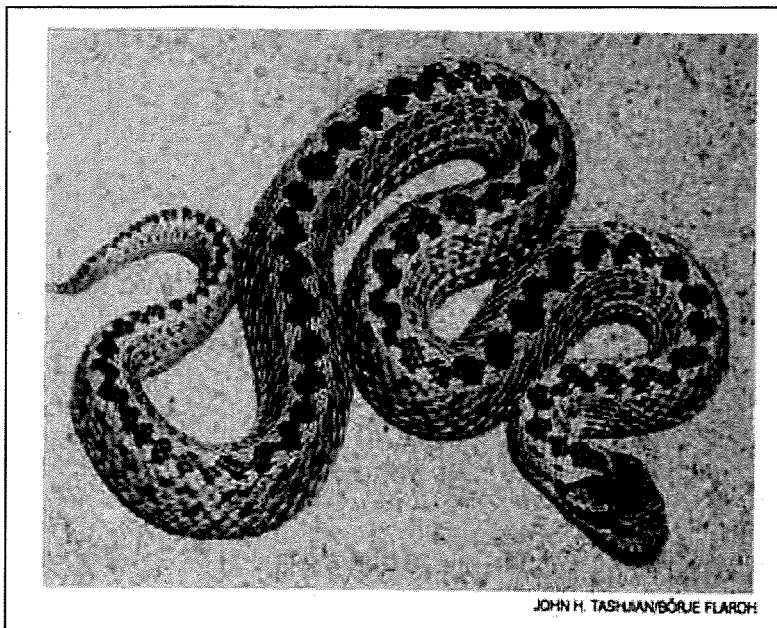
Common Adder - Throughout Europe



Long nosed Adder - Italy, Yugoslavia, northern Albania, and Romania

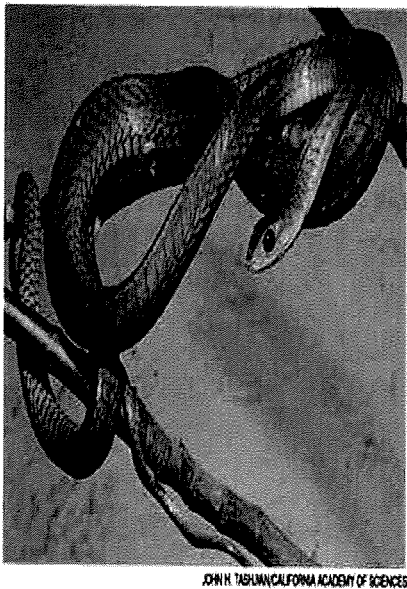


Pellas Viper - Throughout southeastern Europe.



Ursini Viper - Most of Europe, Greece, Germany, Yugoslavia, France, Italy, Hungary, Romania, Bulgaria, and Albania.

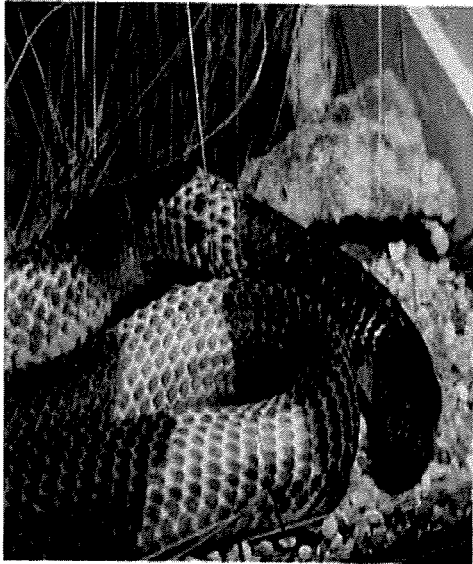
Africa and Asia



Boomslang - sub-Saharan Africa



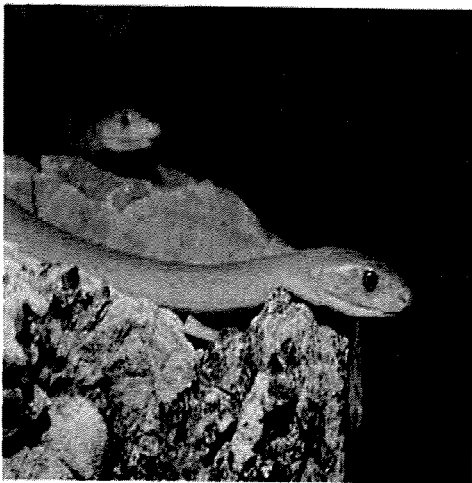
Bush Viper - Most of Africa, Angola, Cameroon, Uganda, Kenya, and Zaire



Africa, Iraq, Syria, and Saudi Arabia



Gaboon viper - Most of Africa



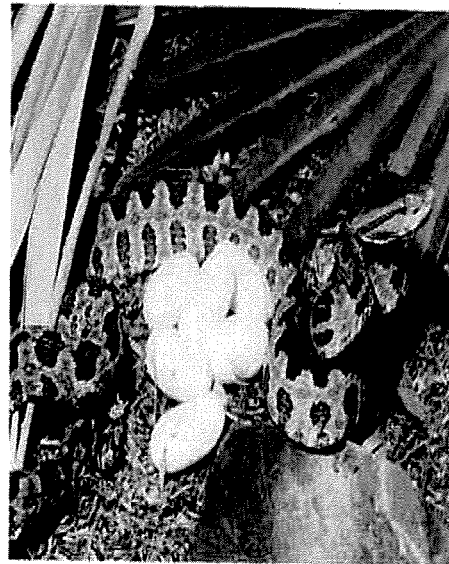
Green Mamba - Most of Africa.



Rhinoceros viper or river jack – Equatorial Africa



Green Tree Pit Viper - India, Burma, Malaya, Thailand, Laos, Cambodia, Vietnam, China, Indonesia, and Formosa.

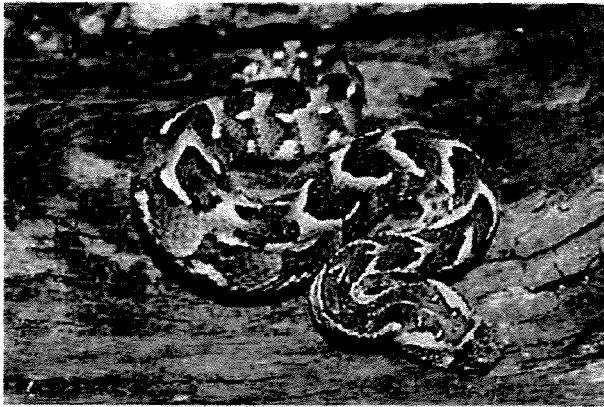


Habu pit viper - Okinawa and neighboring islands and Kyushu

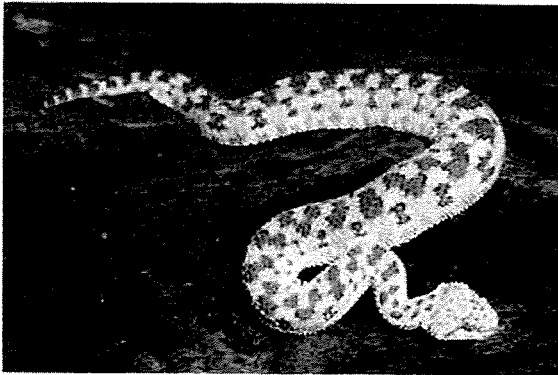


Mole or Burrowing Viper
Sudan, Ethiopia, Somaliland, Kenya, Tanganyika, Uganda, Cameroon, Niger, Congo, and Urundi.

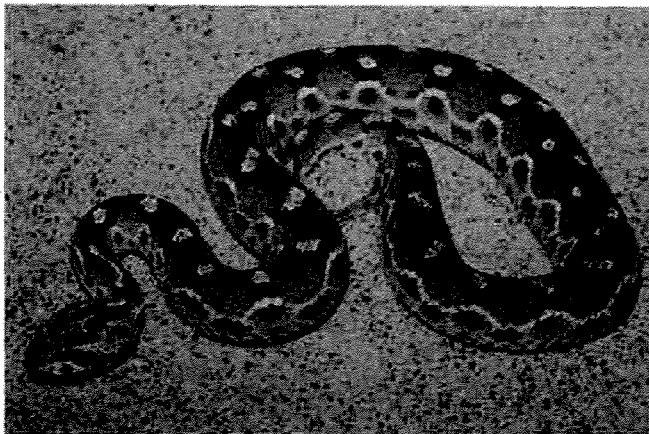
Middle East



Puff Adder - Most of Africa, Saudi Arabia, Iraq, Lebanon, Israel, and Jordan

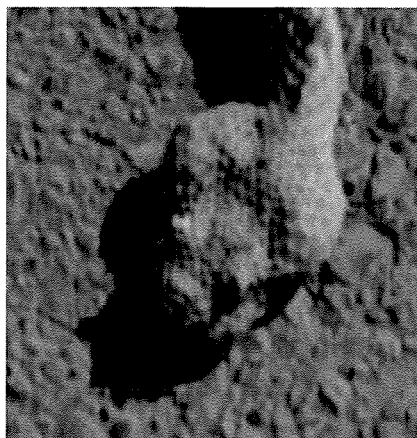


Sand Viper - Northern Sahara, Algeria, Egypt, Sudan, Nigeria, Chad, Somalia, and central Africa.



JOHN H. TASHUJIAN/FORT WORTH ZOO

Saw Scaled Viper - Asia, Syria, India, Africa, Iraq, Iran, Saudi Arabia, Pakistan, Jordan, Lebanon, Sri Lanka, Algeria, Egypt, and Israel.

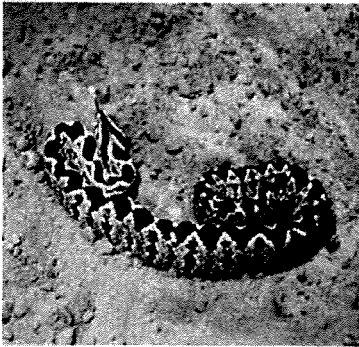


Field's horned viper, False Eye-horned viper - Middle East and as far east as Pakistan

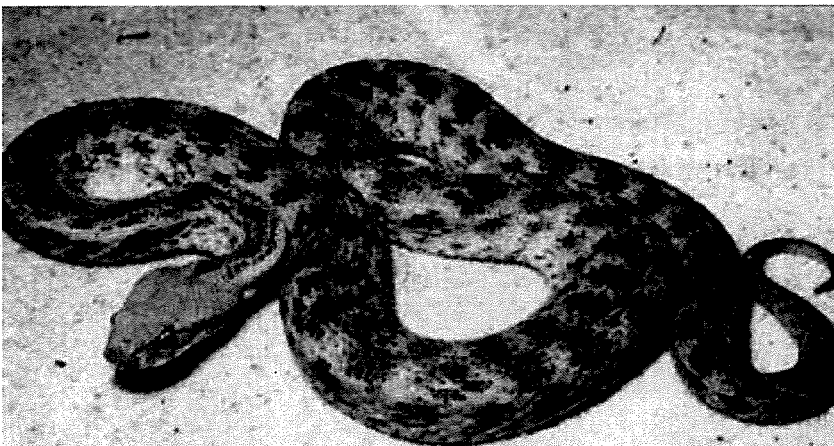


**Horned Asp, (true) Desert Horned/Eye-Horn Viper,
desert horned sidewinder Northern Africa and parts of the Middle East.**

Desert Cobra, Desert Black Snake

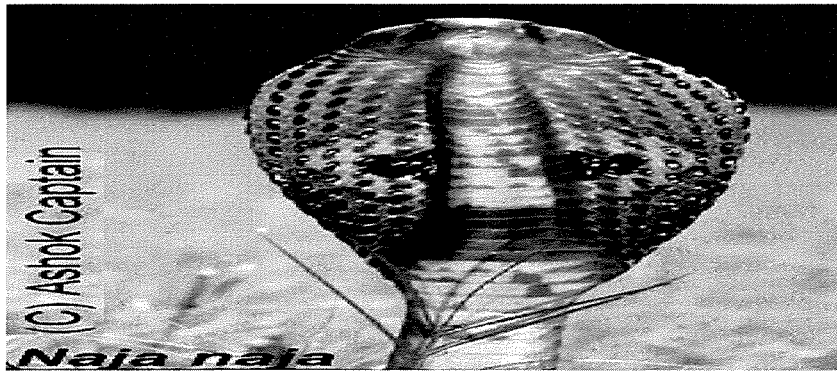


Palestinian Viper - Turkey, Syria, Palestine, Israel, Lebanon, and Jordan

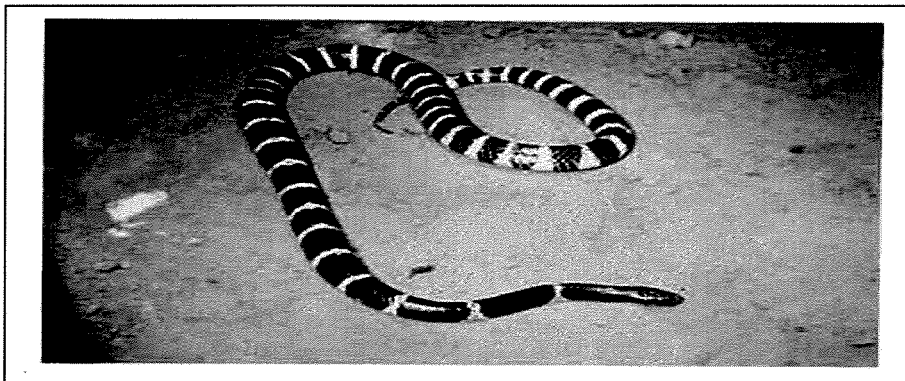


Levant viper or Levant adder, aka: desert or mountain adder, 'kufi' - Greece, Iraq, Syria, Lebanon, Turkey, Afghanistan, lower portion of the former USSR, and Saudi Arabia.

India



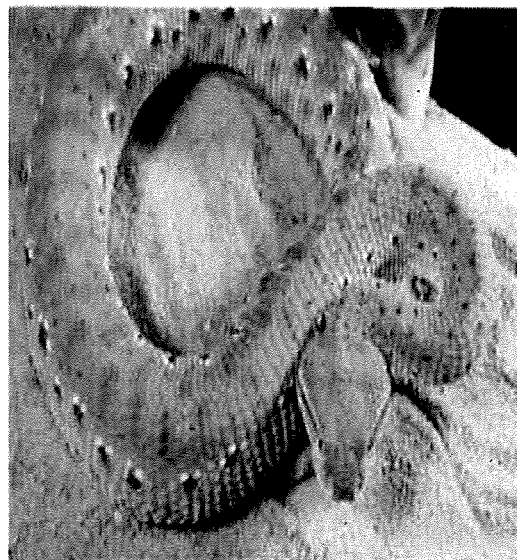
Cobra



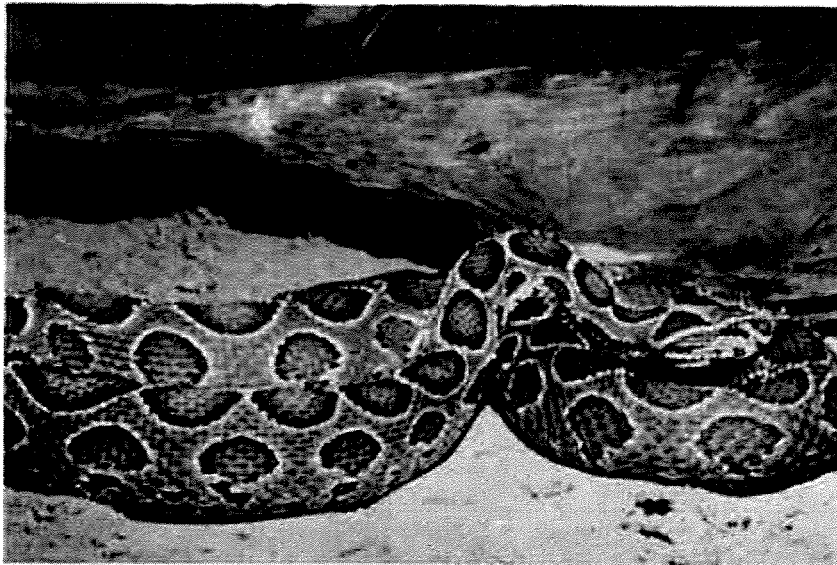
Common Krait -
India, Sri Lanka, and
Pakistan.



Malayan Pit Viper - Thailand, Laos,
Cambodia, Java, Sumatra, Malaysia,
Vietnam, Burma, and China



McMahon's Viper- West Pakistan and Afghanistan.

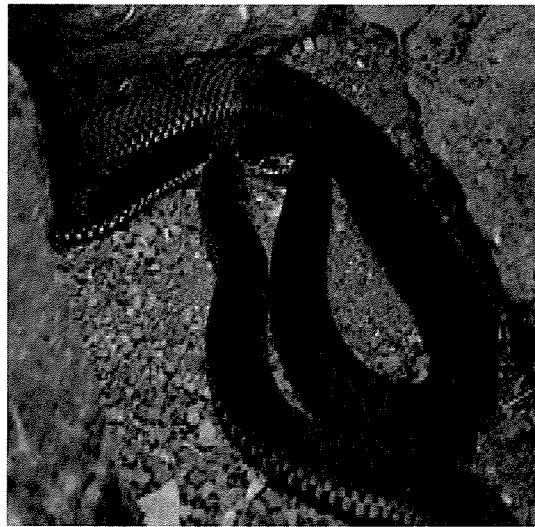
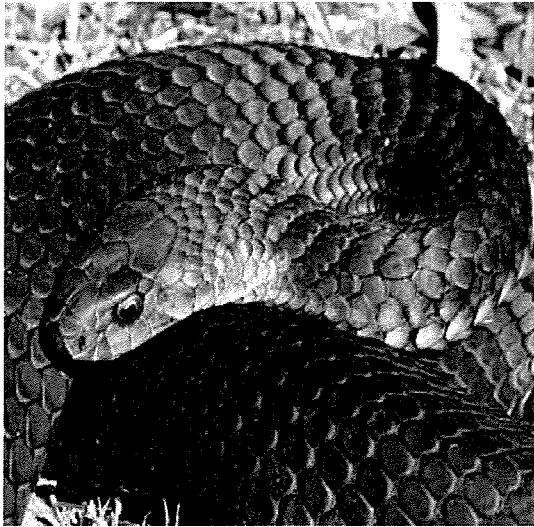


Russell's Viper - Sri Lanka, south China, India, Malaysian Peninsula, Java, Sumatra, Borneo, and surrounding islands.

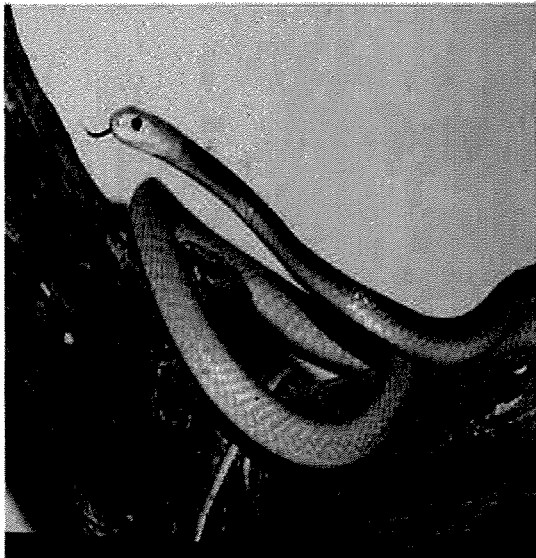


Wagler's pit viper or temple viper - Malaysian Peninsula and Archipelago, Indonesia, Borneo, the Philippines, and Ryuku Islands.

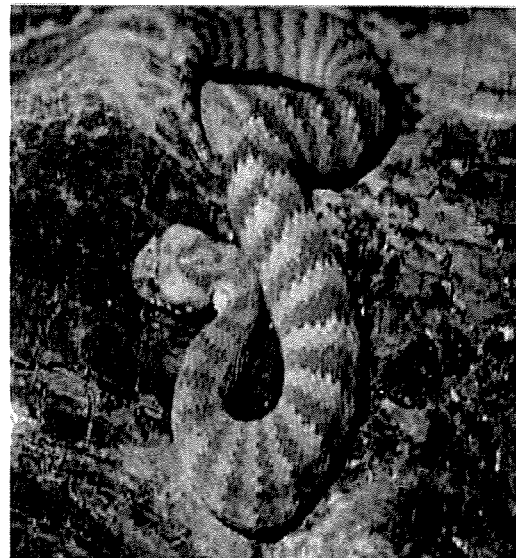
Australasia



Australian Copperhead - Tasmania, South Australia, Queensland, and Kangaroo Island.



Death Adder Australia, New Guinea, and Moluccas

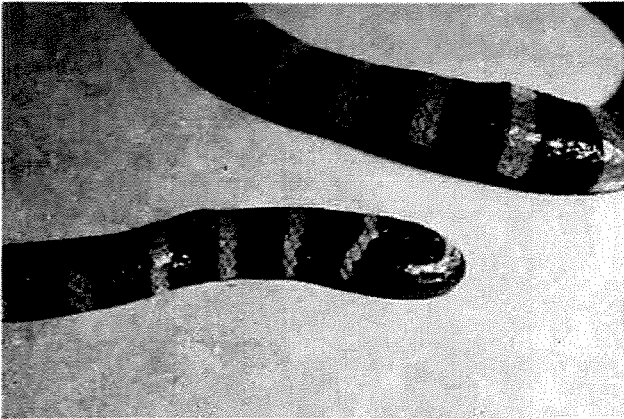


Taipan - Northern Australia and southern New Guinea

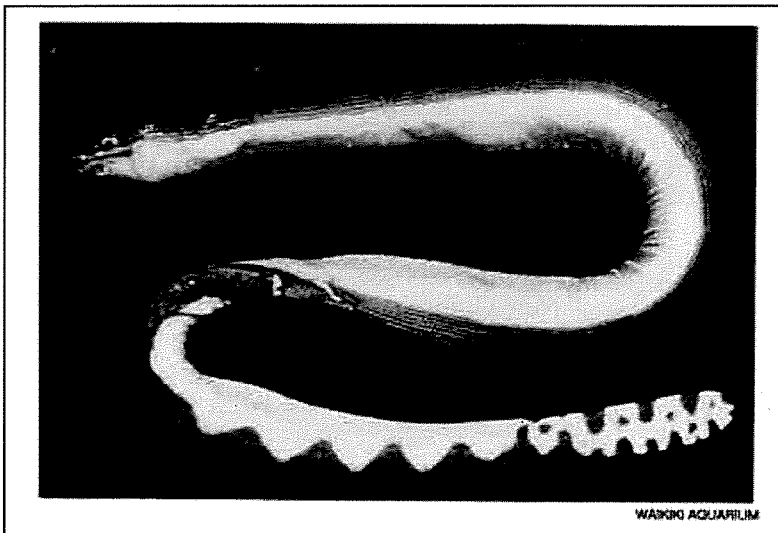


Tiger Snake - Australia, Tasmania, Bass Strait islands, and New Guinea.

Sea Snakes



Banded Sea Snake Coastal waters of New Guinea, Pacific islands, the Philippines, Southeast Asia, Sri Lanka, and Japan.



Yellow Bellied Sea Snake - Throughout the Pacific Ocean from many of the Pacific islands to Hawaii and to the coast of Costa Rica and Panama.

FLD 43 D HAZARDOUS PLANTS

A number of hazardous plants may be encountered during field operations. The ailments associated with these plants range from mild hay fever to contact dermatitis. Plants that present the greatest risk to site workers are those that produce allergic reactions and tissue injury.

Plants That Cause Skin and Tissue Injury

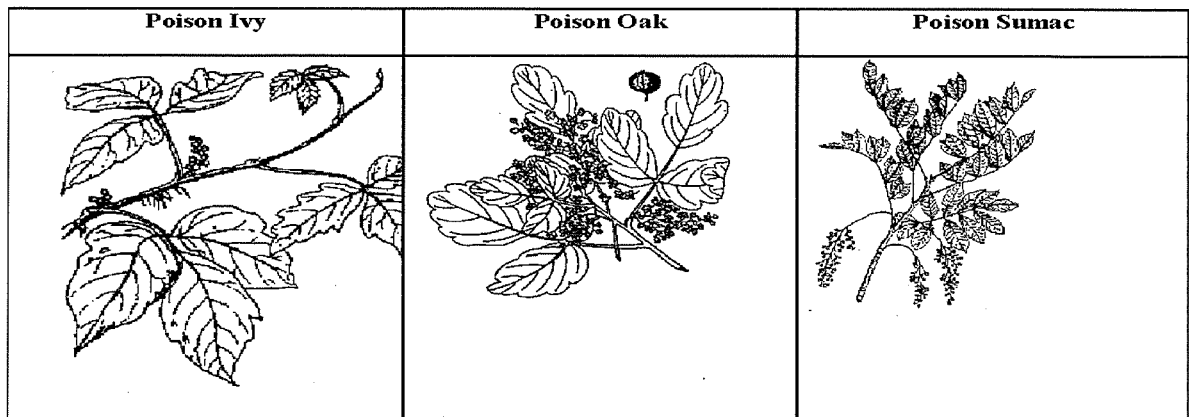
Contact with sharp leaves and thorns are of special concern to site personnel. This concern stems from the fact that punctures, cuts, and even minor scrapes caused by accidental contact may result in skin lesions and the introduction of fungi or bacteria through the skin. This is especially important in light of the fact that the warm moist environment created inside protective clothing is ideal for the propagation of fungal and bacterial infection. Personnel receiving any of the injuries listed above, even minor scrapes shall report immediately for continued observation and care. Keeping the skin covered as much as possible (i.e., long pants and long sleeved shirts) in areas where these plants are known to exist will limit much of the potential exposure.

Plants That Cause an Allergic Reaction

The poisonous plants of greatest concern are poison ivy, poison oak, and poison sumac. Contact with the poisonous sap of these plants produces a severe rash characterized by redness, blisters, swelling, and intense burning and itching. The victim also may develop a high fever and may be very ill. Ordinarily, the rash begins within a few hours after exposure, but it may be delayed for 24 to 48 hours.

The most distinctive features of poison ivy and poison oak are their leaves, which are composed of three leaflets each. In certain seasons, both plants also have greenish-white flowers and berries that grow in clusters. Poison sumac is a tall shrub or small tree with 6 to 12 leaflets arranged in pairs with a single leaflet at the end. This plant grows in wooded, swampy areas.

Poison Ivy/Poison Oak/Poison Sumac



The reaction associated with exposure to these plants will generally cause the following signs and symptoms:

- Blistering at the site of contact, usually occurring within 12 to 48 hours after contact
- Reddening, swelling, itching and burning at the site of contact
- Pain, if the reaction is severe
- Conjunctivitis, asthma, and other allergic reactions if the person is extremely sensitive to the poisonous plant toxin

If the rash is scratched, secondary infections can occur. Preventive measures that are effective for most site personnel include:

- Avoid contact with any poisonous plants on site, and keep a steady watch to identify, report and mark poisonous plants found on site
- Wash hands, face or other exposed areas at the beginning of each break period and at the end of each workday
- Avoid contact with, and wash on a daily basis, contaminated tools, equipment and clothing
- Barrier creams, detoxification/wash solutions and orally administered desensitization may prove effective and should be tried to find the best preventive solution

Keeping the skin covered as much as possible (i.e., long pants and long sleeved shirts) in areas where these plants are known to exist will limit much of the potential exposure.

Plants That are Poisonous

There are a number of plants worldwide beside poison ivy, oak and sumac which have poisonous properties. In many cases consumption of these plants or parts of these plants can result in poisoning. In other cases, contact with the plants may be poisonous. The following is a listing with pertinent information on poisonous properties and locations of a number of plants.

In general, when working in the outdoors or where you may come in contact with household plants or where your families may come in contact with these plants, it is important that as soon as possible after contact the area or areas should be thoroughly washed and hands must be thoroughly washed before eating drinking, smoking or any other hand to mouth contact. C

In keeping with our 24/7 BBS concept, it is important to remember that children are particularly vulnerable to many of the poisonous parts of these plants. Many of these poisonous parts resemble non-poisonous food items such as berries and are attractive.

As with most lists there is extensive information but the list may not include all poisonous plants.

It is important to remember that this document is a starting point to be supplemented with local information. The majority of this information is from a list found in Wikipedia an on line Dictionary readily accessible via Google. The website has pictures of these plants as well as links to other information sources.

POISONOUS PLANTS

From Wikipedia,

This is a list of plants containing poisonous parts that pose a serious risk of illness, injury, or death to humans.

Poisonous Food Plants

- Apple (*Malus domestica*) **Found worldwide in cooler climates.** Seeds contain cyanogenic glycosides; although the amount found in most apples won't kill a person.
- Cherry (*Prunus cerasus*), as well as other species (*Prunus spp*) such as peach (*Prunus persica*), plum (*Prunus domestica*), almond (*Prunus dulcis*) and apricot (*Prunus armeninaca*). **There are around 430 species of *Prunus*, spread throughout the northern temperate regions of the globe.** Leaves and seeds contain cyanogenic glycosides
- Potato (*Solanum tuberosum*) **Potatoes originated in the area of modern day Peru and then spread from South America to Spain and from there to the rest of the world after European colonization in the late 1400s and early 1500s.** Foliage and green-tinged tubers are toxic, containing the glycoalkaloid solanine, which develops as a result of exposure to light. Causes intense digestive disturbances, nervous symptoms.
- Rhubarb (*Rheum rhaponticum*) **Found worldwide.** Leaves, but not stems, contain oxalic acid salts, causing kidney disorders, convulsions, coma. Rarely fatal.
- Tomato (*Solanum lycopersicum*) **Found worldwide.** Foliage and vines contain alkaloid poisons which cause digestive upset and nervous excitement.

Other Poisonous Plants

- Aconite (wolfsbane, monkshood) (*Aconitum napellus*) **Chiefly natives of the mountainous parts of the northern hemisphere, growing in moisture retentive but well draining soils on mountain meadows.** The poison is concentrated in the unripe seed pods and roots, but all parts are poisonous. Causes digestive upset, nervous excitement. The juice in plant parts is **often fatal.**
- Autumn crocus. **Europe, North America and Middle East.** The bulbs are poisonous and cause nausea, vomiting, diarrhea. **Can be fatal.**
- Azalea **Found Worldwide.** All parts of the plant are poisonous and cause nausea, vomiting, depression, breathing difficulties, coma. Rarely fatal.
- Bittersweet nightshade **It is native to Europe and Asia, and widely naturalised elsewhere, including North America.** All parts are poisonous, containing solanine and causing fatigue, paralysis, convulsions and diarrhea. Rarely fatal.

- Bleeding heart / Dutchman's breeches. **North America.** Leaves and roots are poisonous and cause convulsions and other nervous symptoms.
- Black locust. **Southeastern United States, also widely planted and naturalized elsewhere in temperate North America, Europe and Asia.** Pods are toxic
- Black nightshade (*Solanum nigrum*) **Native to Eurasia and also introduced in the Americas. In Hawaii it is called popolo.** All parts of the plant except the *ripe* fruit contain the toxic glycoalkaloid solanine
- Angel's Trumpet (*Brugmansia*). **Native to subtropical regions of South America, along the Andes from Colombia to northern Chile, and also in southeastern Brazil.** All parts of the plant contains the tropane alkaloids scopolamine and atropine. Often fatal.
- Caladium / Elephant ear. **Indigenous to Brazil and to neighboring areas of South America and Central America Cultivated as ornamental plants in temperate North America.** All parts of the plant are poisonous. Symptoms are generally irritation, pain, and swelling of tissues. If the mouth or tongue swell, breathing may be fatally blocked.
- Castor Oil Plant (*Ricinus communis*) Castor Oil Plant. **Indigenous to the southeastern Mediterranean region and Eastern Africa, today it is widespread throughout tropical regions and is found Worldwide.** The phytotoxin is ricin, an extremely toxic water soluble protein, which is concentrated in the seed. Also present are ricinine, an alkaloid, and an irritant oil. Causes burning in mouth and throat, convulsions, and is **often fatal.**
- Daffodil. **Native to Europe, North Africa, and Asia, found worldwide.** The bulbs are poisonous and cause nausea, vomiting, and diarrhea. **Can be fatal.**
- Daphne (*Daphne sp.*) **Native to Asia, Europe, and north Africa, also found as ornamental plant worldwide.** The berries (either red or yellow) are poisonous, causing burns to mouth and digestive tract, followed by coma. **Often fatal.**
- Darnel/Poison Ryegrass (*Lolium temulentum*) **Usually grows in the same production zones as wheat and is considered a weed.** The seeds and seed heads of this common garden weed may contain the alkaloids temuline and loliine. Some experts also point to the fungus ergot or fungi of the genus endoconidium both of which grow on the seed heads of rye grasses as an additional source of toxicity.
- Datura nightshade. **Found in temperate and tropical regions of the globe, but is most likely restricted to the Americas, from the United States south through Mexico (where the highest species diversity occurs) to the mid-latitudes of South America. Found in China, It also grows naturally throughout India and most of Australia..** Contains the alkaloids scopolamine and atropine. Datura has been used as a hallucinogenic drug, eg by the native peoples of the Americas.

- Deadly nightshade (*Atropa belladonna*) **Native to Europe, North Africa, and Western Asia, and has become naturalized in parts of North America.** All parts of the plant contain the toxic alkaloid atropine. The young plants and seeds are especially poisonous, causing nausea, muscle twitches, paralysis; **often fatal.**
- Deathcamas / black snakeroot/Star Lily **Found in North America and Asia.** All parts of the plant are poisonous, causing nausea, severe upset.
- Delphinium/Larkspur Contains the alkaloid Delsoline. **Native throughout the Northern Hemisphere and also on the high mountains of tropical Africa.** Young plants and seeds are poisonous, causing nausea, muscle twitches, paralysis, **often fatal.**
- Doll's eyes/White Baneberry). **Native to eastern North America.** Berries are highly poisonous, as well as all other parts.
- Dumbcane / dieffenbachia. **Found in tropical areas and popular as house plants.** All parts are poisonous, causing intense burning, irritation, and immobility of the tongue, mouth, and throat. Swelling can be severe enough to block breathing leading to death.
- Elderberry **Native to temperate to subtropical regions of both the Northern Hemisphere and the Southern Hemisphere;** the genus is more widespread in the Northern Hemisphere, with Southern Hemisphere occurrence restricted to parts of Australasia and South America. The roots are poisonous and cause nausea and digestive upset.
- European Holly (*Ilex aquifolium*) **Native to western and southern Europe, northwest Africa and southwest Asia widely planted in New Zealand, the cooler areas of Australia, and North America.** The berries are poisonous, causing gastroenteritis.
- Foxglove (*Digitalis purpurea*). **Native to Europe, western and central Asia, and northwestern Africa (widely grown as an ornamental plant.** The leaves, seeds, and flowers are poisonous, containing cardiac or other steroid glycosides. These cause irregular heartbeat, and generally digestive upset and confusion. **Can be fatal.**
- Gifblaar (*Dichapatehum cymosum*) . Found in **South Africa**; this plant contains the metabolic poison fluoroacetic acid and appears to be a hazard primarily to livestock.. Fluoroacetic acid is also found in at least 40 Australian plant species.
- Hemlock (*Conium maculatum*). **Native to Europe and the Mediterranean region (*C. maculatum*), and to southern Africa (*C. chaerophylloides*).** **Poison hemlocks have also been cultivated in much of Asia, North America and Australia.** All parts of the plant contain the relatively simple alkaloid coniine which causes stomach pains, vomiting, progressive paralysis of the central nervous system. Can be fatal; it is the poison which killed Socrates.

- Henbane **Originated in Eurasia though it is now globally distributed.** Seeds and foliage poisonous. An anesthetic as well as having psychoactive properties. Toxic effects of henbane use in humans include hallucinations, dilated pupils, restlessness, and flushed skin and potentially tachycardia, convulsions, vomiting, hypertension, hyperpyrexia and ataxia
- Horse-chestnut. **Native to a small area in the mountains of the Balkans in southeast Europe, in small areas in northern Greece, Albania, the Republic of Macedonia, Serbia, and Bulgaria. It is widely cultivated throughout the temperate world.** All parts of the plant are poisonous, causing nausea, muscle twitches, and sometimes, paralysis.
- Hyacinth. **Native to southwestern Asia, in southern and central Turkey, northwestern Syria and Lebanon. It is widely cultivated throughout world.** The bulbs are poisonous, causing nausea, vomiting, gasping, convulsions, and possibly death.
- Ivy. Native to the Atlantic Islands, western, central and southern Europe, northwestern Africa, across central-southern Asia east to Japan and parts of North America where winters are not severe. The leaves and berries are poisonous, causing stomach pains, labored breathing, possible coma.
- Jequirity **Tropical areas of in Africa, in Asia and in the Americas.** The seed is highly poisonous. Toxicity is similar to that of ricin, however, more toxic and deadly. Berries are used for beads. A puncture with an object contaminated with the toxin can be deadly.
- Jerusalem cherry **USA, NC, South America** All parts, especially the berries, are poisonous, causing nausea and vomiting. **Looks like a cherry tomato.** It is occasionally fatal, especially to children.
- Jimson weed / datura / thorn apple / stinkweed / /gypsum weeds/Jamestown weed (*Datura stramonium*) **It is found throughout much of the United States, most commonly in the South except for Texas. Datura stramonium is also found throughout many other parts of the world.** All parts of the plant are poisonous, causing abnormal thirst, vision distortions, delirium, incoherence, coma. Often fatal.
- Laburnum **native to the mountains of southern Europe from France to the Balkan Peninsula. Cultivated worldwide as an ornamental.** Some botanists include a third species, *Laburnum caramanicum*, but this native of southeast Europe and Asia Minor is usually treated in a distinct genus *Podocytisus*, more closely allied to the brooms. All parts, especially the seeds, are poisonous, causing excitement, staggering, convulsions, coma, occasionally fatal.
- Larkspur (both *Delphinium* and *Consolida*). **Native throughout the Northern Hemisphere and also on the high mountains of tropical Africa.** Young plants and seeds are poisonous, causing nausea, muscle twitches, paralysis. Often fatal.
- Lilies **Worldwide** There are some 3500 species that comprise the lily (Lilaceae) family. Some are beneficial including (foods such as onion, shallot, garlic, chives [all *Allium* spp] and asparagus) and some with medicinal uses (colchicine and red squill) Many produce alkaloids which are poisonous, especially to cats.

- **Manchineel (*Hippomane mancinella*) Native to the Caribbean (including Florida, Puerto Rico and the Virgin Islands) also found in Central America, South America and Western Africa.** It is one of the most poisonous trees in the world All parts of this tree including the fruit contain toxic phorbol esters typical of the Euphorbiaceae. Sap may cause burning of the skin and smoke from burning may cause eye irritation and blindness. Fruits, which are similar in appearance to an apple, are green or greenish-yellow when ripe.
- **Mayapple (*Podophyllum peltatum*) Native to the eastern part of North America.** Green portions of the plant, unripe fruit, and especially the rhizome contain the non-alkaloid toxin podophyllotoxin which causes diarrhea, severe digestive upset.
- **Monkshood.** See Aconite above.
- **Moonseed.** Native to North America, East Asia, and Mexico. The fruits and seeds are poisonous, causing nausea and vomiting. **Often fatal.**
- **Oleander (*Nerium oleander*) Native to a broad area from Morocco and Portugal eastward through the Mediterranean region and southern Asia to Yunnan in southern parts of China. Cultivated worldwide as an ornamental.** All parts are toxic, containing nerioside, oleandroside, saponins, cardiac glycosides, but especially the leaves and woody stems. They cause severe digestive upset, heart trouble, contact dermatitis. **Often fatal.**
- **Oak Worldwide** Most species foliage and acorns are mildly poisonous, causing digestive upset, heart trouble, contact dermatitis. Rarely fatal.
- **Poison-ivy (*Toxicodendron radicans*), Poison-oak (*T. diversilobum*), and Poison Sumac (*T. vernix*) North America** All parts of these plants contain a highly irritating oil with urushiol (this is actually not a poison but an allergen). Skin reactions can include blisters and rashes. It spreads readily to clothes and back again, and has a very long life. Infections can follow scratching.
- **Pokeweed (*Phytolacca* sp.) Native to North America, South America, East Asia and New Zealand.** Leaves, berries and roots contain phytolaccatoxin and phytolaccigenin - toxin in young leaves is reduced with each boiling and draining.
- **Privet (*Ligustrum* sp.) Native to Europe, north Africa, Asia and Australasia, with the centre of diversity in China, the Himalaya, Japan and Taiwan. Cultivated worldwide.** Berries and leaves are poisonous. Berries contain ligustrin and syringin, which causes digestive disturbances, nervous symptoms. **Can be fatal.**
- **Water hemlock/Cowbane) Native to temperate regions of the Northern Hemisphere mainly North America.** All parts **extremely poisonous.**

- White snakeroot. **Native to eastern North America.** All parts are poisonous, causing nausea and vomiting. **Often fatal.**
- Yellow Jessamine/Yellow Jasmine. **Native plant in the southeastern United States as far west as Texas, tropical America from Guatemala north.** All parts are poisonous, causing nausea and vomiting. Often fatal. It's possible to become ill from ingesting honey made from jessamine nectar.
- Yew (*Taxus baccata*). **Native to western, central and southern Europe, northwest Africa, northern Iran and southwest Asia. Used Worldwide as an ornamental.** All parts of the plant, except for the fleshy red bit of the fruit, contain taxane alkaloids. The seeds are especially poisonous and are quickly fatal when ingested.

FLD 47 CLEARING, GRUBBING AND LOGGING OPERATIONS

RELATED FLDs AND PROGRAMS

FLD 22 – Heavy Equipment Operation

FLD 31 – Fire Prevention and Protection Planning

FLD 32 – Fire Extinguishers Required and Requirements

FLD 38 – Hand and Power Hand Tools

Occupational Noise and Hearing Conservation Program

Safety procedures must be evaluated and utilized for all types of clearing, grubbing, and logging activities. The primary purpose of this FLD is to evaluate safe practices by WESTON personnel who occasionally must use chain saws and other equipment to perform limited tasks. Performance of logging activities by WESTON personnel is limited to trained personnel performing small-scale ancillary tasks within the criteria outlined in this FLD. Basic subcontractor compliance requirements are also provided in this FLD.

Logging tasks on WESTON projects are rare and typically performed by a subcontractor. WESTON may perform mechanical clearing, grubbing, and logging using heavy equipment, or manually using hand and power tools.

TRAINING

Project Managers are responsible for verifying that personnel are appropriately trained and prepared to perform tasks necessary.

Any employee or subcontractor performing logging tasks or work with chain saws must provide documentation of training to the Project and/or Site Manager prior to performance of task activities. Subcontractors may document compliance with requirements of 29 CFR 1910.266 by means of individual certificates or by a letter that certifies compliance by all subcontract employees. Training for WESTON personnel consists of formal, documented overview of this FLD and OSHA's Logging Regulation (29 CFR 1910.266), and viewing the Chain Saw Safety Video (LC02) available on the WESTON EHS Portal Site.

On-the-job training for chain saw and chipper operations will be provided by experienced personnel and consist of review of the chain saw operations manual, review of equipment and protective equipment requirements, and observation for competency during task operations.

HAZARD EVALUATION

Operations must meet requirements of 29 CFR 1910.266. Activity hazards analyses must be performed and site-specific health and safety plan (HASP) prepared in accordance with the Corporate Environmental Health and Safety Program prior to beginning the task. For logging activities, hazard evaluation must include, but is not limited to terrain, weather, tree size and lean, tree configuration and condition (e.g., visible dead wood, rotting, fungal growth, lack of new growth), potential for throwback during felling, and proximity to other workers, utilities and equipment. It is recommended that the on-line Logging eTool (available on www.osha.gov) be used as a tool for hazards analyses and HASP development.

LIMITATIONS TO WESTON-PERFORMED ACTIVITIES

Because WESTON personnel do not typically perform clearing or logging activities, the following WESTON limitations on tree felling are established. For those hazards or tasks that exceed the limitations indicated, work must be performed by a subcontractor.

Manual Felling

Manual felling is limited to trained employees with personal protection equipment (PPE) and other equipment appropriate to the task. Limitations include:

- Tree size limited to less than 12 inches diameter.
- Chain saw bar maximum size limited to 16 inches.
- No climbing or elevated platform cuts unless limited to non-powered hand tools for nuisance limb clearing.
- Felling cuts limited to the Open Face Cut.
- No felling of "Danger Trees" (i.e., standing trees that present employee hazard due to conditions such as, but not limited to, deterioration or physical damage to the root system, trunk, stem or limbs, inappropriate direction or lean of the tree, prominent fork in trunk or double trees, creating potential felling hazard, hung or entangled trees and snags that create unreasonable risk to the feller during manual cuts). Danger trees are to be removed by mechanical aid or subcontractor.
- No felling of "Spring poles" created during felling unless employee specifically qualified to release created tension, otherwise these must be mechanically removed.
- No felling of trees located within 2 tree length distance to hazards such as active roadways, elevated utility lines, buildings, etc.
- No felling on sloping terrain such that safe felling and retreat is compromised.

Mechanical Felling

Mechanical felling is limited to trained and experienced equipment operators with equipment appropriate to the task.

Tree size is limited to less than 12 inches diameter.

Trees cannot be located within 2 tree length distance to hazards such as active roadways, elevated utility lines, buildings, etc.

ENVIRONMENTAL CONDITIONS

Work performed by WESTON or a subcontractor must be stopped and employees moved to safe areas when environmental conditions are imminent such as, but not limited to, electrical storms, high winds, heavy rain, fog, or snow, extreme cold, or darkness.

SAFETY PRECAUTIONS

All hand tools, power tools, required safety equipment, and supplies must be inspected before use on each shift in accordance with the Corporate EHS Program and FLD 38, "Hand and Power Hand Tools." Damaged or missing items must be repaired or replaced before work startup.

WESTON corporate EHS Program first aid and fire protection (FLD 31 and FLD 32) requirements must be met. Signaling equipment (i.e., hand or audible - discernable above background noise) must be available. An air horn is suggested. Operation and maintenance manuals must be available on-site for tools such as chain-saws and chippers. Checklists should be developed to ensure compliance with 29 CFR 1910.266.

PERSONAL PROTECTIVE EQUIPMENT:

Required PPE is determined during activity hazards analyses. The following should be considered for clearing, grubbing, and logging operations.

- Hand Protection: Must be adequate for protection from puncture wounds, cuts, lacerations.
- Leg Protection: Chain saw operators must wear cut-resistant (e.g., ballistic nylon or equivalent) leg protection which covers full length from thigh to the top of the boot for each leg (for subcontracted operations see exceptions in 29 CFR 1910.266(d) if necessary).
- Foot Protection: Water-proof or water repellent foot protection which covers and supports the ankle. If operating a chain saw, material must be cut-resistant (e.g., multiple layers of material such as ballistic nylon, kevlar). Cut-resistant material can be intrinsic to the boot construction or as an approved supplemental attachment.
- Head Protection: Hard hats required.
- Hearing Protection: Hearing protection capable of reducing the noise level to less than 85 dBA required.
- Eye Protection: Safety glasses required.
- Face Protection: ANSI approved safety glasses and face shield required when operating chipper. Face shield (e.g. mesh screen or ANSI clear) required when operating chain saw, unless determined that use of face shield creates greater hazard.

FLD 52 ASBESTOS EXPOSURE CONTROL PROGRAM

This Exposure Control Program will be reviewed annually and updated as appropriate to reflect any changes that may impact WESTON's compliance status.

RELATED PROGRAMS:

Respiratory Protection Program
Occupational Medical Monitoring Program
Personal Protective Equipment Program

WESTON will ensure that appropriate authorities are notified in accordance with regulations when asbestos work is to be performed and will ensure proper registrations are in place. Independent subcontractors not under WESTON's direct supervision will be solely responsible for notifications to appropriate federal, state, and local authorities.

This Program applies to all WESTON employees and subcontractors who work with asbestos.

Permissible Exposure Limits (PELS)

WESTON will ensure that no employee will be exposed to an airborne concentration of asbestos in excess of 0.1 fiber per cubic centimeter (f/cc) of air as an 8-hour time-weighted average (TWA), as determined by the method prescribed in Appendix A to this Program, or by an equivalent method.

WESTON will ensure that no employee is exposed to an airborne concentration of asbestos in excess of 1.0 f/cc of air averaged over a sampling period of 30 minutes, as determined by the method prescribed in Appendix A to this Program, or by an equivalent method.

Multi-Employer Worksites

On multi-employer worksites, when performing work requiring the establishment of a regulated area, WESTON will inform other employers on the site of the nature of WESTON's work with asbestos and/or PACM, of the existence of and requirements pertaining to regulated areas, and the measures taken to ensure that employees of such other employers are not exposed to asbestos.

Asbestos hazards at a multi-employer work site will be abated by the contractor who created or controls the source of asbestos contamination. For example, if there is a significant breach of an enclosure containing Class I work, the employer responsible for erecting the enclosure will repair the breach immediately.

In addition, WESTON will comply with all applicable protective provisions of this standard to protect its employees exposed to asbestos hazards. For example, if employees working immediately adjacent to a Class I asbestos job are exposed to asbestos due to the inadequate containment of such job, their employer will either remove the employees from the area until the enclosure breach is repaired; or perform an initial exposure assessment pursuant to 20 CFR 1926.1101(f).

All employers of employees working adjacent to regulated areas established by WESTON on a multi-employer work-site will take steps on a daily basis to ascertain the integrity of the enclosure and/or the effectiveness of the control method relied on by the primary asbestos contractor to assure that asbestos fibers do not migrate to adjacent areas.

Likewise, on multi-employer sites WESTON will take steps on a daily basis to ascertain the integrity of the enclosure and/or the effectiveness of the control method relied on by the primary asbestos contractor to assure that asbestos fibers do not migrate to adjacent areas.

WESTON and all general contractors on a construction project which includes work covered by 29 CFR 1926.1101 will be expected to exercise general supervisory authority over the work covered by this standard, even though the general contractor is not qualified to serve as the asbestos "competent person" as defined by paragraph 29 CFR 1926.1101(b). As supervisor of the entire project, WESTON or the responsible general contractor will ascertain whether the asbestos contractor is in compliance with the asbestos standard, and will require such contractor to come into compliance with 29 CFR 1926.1101 when necessary.

Regulated Areas [under 29 CFR 1926.1101]

All Class I, II, and III asbestos work will be conducted within regulated areas. All other operations covered by asbestos standards will be conducted within a regulated area where airborne concentrations of asbestos exceed, or there is a reasonable possibility they may exceed a PEL. Regulated areas will comply with the following requirements of 29 CFR 1926.1101(2), (3), (4), and (5).

- Demarcation: The regulated area will be demarcated to minimize the number of persons within the area and protect persons outside the area from exposure to airborne asbestos. Where critical barriers or negative pressure enclosures are used, they will be used to demarcate the regulated area. Signs will be provided and displayed pursuant to the requirements of subsection 29 CFR 1926.1101(k)(7).
- Access: Access to regulated areas will be limited to authorized persons and to persons authorized by the 29 CFR 1926.1101.
- Respirators: All persons entering a regulated area where employees are required by 29 CFR 1926.1101(h)(1) to wear respirators will be supplied with a respirator selected in accordance with 29 CFR 1926.1101(h)(2) and 29 CFR 1910.134.
- Prohibited Activities: WESTON will ensure that employees do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in the regulated area.

Regulated Areas [under 29 CFR 1910.1001(e)]

- Establishment: WESTON will establish regulated areas wherever airborne concentrations of asbestos and/or PACM are in excess of the TWA and/or excursion limit prescribed in 29 CFR 1910.1001(c).
- Demarcation: Regulated areas shall be demarcated from the rest of the workplace in any manner that minimizes the number of persons who will be exposed to asbestos.
- Access: Access to regulated areas shall be limited to authorized persons or to persons authorized by the Act or regulations issued pursuant thereto.
- Provision of Respirators: Each person entering a regulated area shall be supplied with and required to use a respirator, selected in accordance with 29 CFR 1910.1001(g)(2).
- Prohibited Activities: The employer shall ensure that employees do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in the regulated areas.

Exposure Assessments and Monitoring

1. General Monitoring Criteria

When WESTON has a workplace or work operation where exposure monitoring is required under 29 CFR 1926.1101, WESTON will ensure monitoring is performed to determine accurately the airborne concentrations of asbestos to which employees may be exposed.

Determinations of employee exposure will be made from breathing zone air samples that are representative of the 8-hour TWA and 30-minute short-term exposures of each employee.

Representative 8-hour TWA employee exposure will be determined on the basis of one or more samples representing full-shift exposure for employees in each work area. Representative 30-minute short-term employee exposures will be determined on the basis of one or more samples representing 30 minute exposures associated with operations that are most likely to produce exposures above the excursion limit for employees in each work area.

2. Initial Exposure Assessment

For asbestos projects covered by the standard WESTON will ensure that a "competent person" conducts an exposure assessment immediately before or at the initiation of the operation to ascertain expected exposures during that operation or workplace.

The assessment must be completed in time to comply with requirements that are triggered by exposure data or the lack of a "negative exposure assessment," and to provide information necessary to assure that all control systems planned are appropriate for that operation and will work properly.

3. Basis of Initial Exposure Assessment

Unless a negative exposure assessment has been made pursuant to 29 CFR 1926.1101(f)(2)(iii), the initial exposure assessment will, if feasible, be based on monitoring conducted according to 29 CFR 1926.1101(f)(1)(iii). The assessment will take into consideration both the monitoring results and all observations, information or calculations which indicate employee exposure to asbestos, including any previous monitoring conducted in the workplace, or of the operations of the employer which indicate the levels of airborne asbestos likely to be encountered on the job.

For Class I asbestos work, until the employer conducts exposure monitoring and documents that employees on that job will not be exposed in excess of the PELs, or otherwise makes a negative exposure assessment pursuant to 29 CFR 1926.1101(f)(2)(iii), WESTON will presume that employees are exposed in excess of the TWA and excursion limit.

4. Negative Exposure Assessment

For any one specific asbestos job which will be performed by employees who have been trained in compliance with the standard, a negative exposure assessment demonstrates that employee exposures will be below the PELs by data which conform to the following criteria:

- Objective data demonstrating that the product or material containing asbestos minerals or the activity involving such product or material cannot release airborne fibers in concentrations exceeding the TWA and excursion limit under those work conditions having the greatest potential for releasing asbestos; or

- WESTON has monitoring data from prior asbestos jobs for the 8-hour PEL and the excursion limit within 12 months of the current or projected job, the monitoring and analysis must have been performed in compliance with the asbestos standard in effect; and the data must have been obtained during work conducted under conditions "closely resembling" the processes, type of material, control methods, work practices, and environmental conditions used and prevailing in WESTON's current operations. The operations must have been conducted by employees whose training and experience are no more extensive than that of employees performing the current job, and, the data shows that under the conditions prevailing and which will prevail in the current workplace there is a high degree of certainty that employee exposures will not exceed the TWA and excursion limit, or
- The results of initial exposure monitoring of the current job made from breathing zone air samples that are representative of the 8-hour TWA and 30-minute short-term exposures of each employee covering operations which are most likely during the performance of the entire asbestos job to result in exposures over the PELs.

5. Periodic Monitoring

WESTON will ensure that for all Class I and II operations daily monitoring representative of the exposure of each employee who is assigned to work within a regulated area, will be conducted unless a negative exposure assessment for the entire operation has been made.

Periodic monitoring of all work where exposures are expected to exceed a PEL, will be conducted at intervals sufficient to document the validity of the exposure prediction for all operations other than Class I and II operations.

Exception: When all employees required to be monitored daily are equipped with supplied-air respirators operated in the positive-pressure mode, the employer may dispense with the daily monitoring required by this paragraph. However, employees performing Class I work using a control method which is not listed in 29 CFR 1926.1101(g)(4)(i), (ii), or (iii), or using a modification of a listed control method, will continue to be monitored daily even if they are equipped with supplied-air respirators.

6. Termination of Monitoring

If the periodic monitoring required by 29 CFR 1926.1101(f)(3) reveals that employee exposures, as indicated by statistically reliable measurement, are below the permissible exposure limit and excursion limit the employer may discontinue monitoring for those employees whose exposures are represented by such monitoring.

Additional monitoring will be provided whenever there has been a change in: process, control equipment, personnel or work practices that may result in new or additional exposures above the PEL and/or excursion limit. Additional monitoring will also be provided when the employer has any reason to suspect that a change may result in new or additional exposures above the PEL and/or excursion limit. Such additional monitoring is required regardless of whether a "negative exposure assessment" was previously produced for a specific job.

7. Observation of Monitoring

Affected employees and their designated representatives will be afforded an opportunity to observe any monitoring of employee exposure to asbestos conducted in accordance with this section.

When observation of the monitoring of employee exposure to asbestos requires entry into an area where the use of protective clothing or equipment is required, the observer will be provided with and be required to use such clothing and equipment and will comply with all other applicable safety and health procedures.

Methods of Compliance

Prior to beginning an asbestos project, WESTON will supplement this written program, with a site-specific Health and Safety Plan (HASP), to reduce employee exposure below the TWA and the excursion limit by establishing site-specific engineering, work practice controls, and respiratory protection, and implementing the Health and Safety Plan.

Written programs and site-specific HASPs will be submitted upon request for examination and copying to the Assistant Secretary, the Director, affected employees and designated employee representatives.

The site-specific HASP will include, as a minimum, the procedures, practices and prohibitions identified in this Program and good practice to minimize employee exposure to asbestos and comply with regulations.

Engineering Controls and Work Practices

WESTON will use the following engineering controls and work practices in all operations covered by this section, regardless of the levels of exposure:

- Vacuum cleaners equipped with HEPA filters to collect all debris and dust containing ACM and PACM, except as provided in 29 CFR 1926.1101(g)(8)(ii) in the case of roofing material.
- Wet methods, or wetting agents, to control employee exposures during asbestos handling, mixing, removal, cutting, application, and cleanup, except where employers demonstrate that the use of wet methods is infeasible due to for example, the creation of electrical hazards, equipment malfunction, and, in roofing, except as provide in 29 CFR 1926.1101(g)(8)(ii); and
- Prompt clean-up and disposal of wastes and debris contaminated with asbestos in leak-tight containers except in roofing operations, where the procedures specified in 29 CFR 1926.1101(g)(8)(ii) apply.

In addition to the requirements of 29 CFR 1926.1101(g)(1), WESTON will use the following control methods to achieve compliance with the TWA PEL and excursion limit prescribed by 29 CFR 1926.1101(c):

- Local exhaust ventilation equipped with HEPA filter dust collection systems;
- Enclosure or isolation of processes producing asbestos dust;
- Ventilation of the regulated area to move contaminated air away from the breathing zone of employees and toward a filtration or collection device equipped with a HEPA filter;
- Use of other work practices and engineering controls that the Assistant Secretary can show to be feasible.

Wherever the feasible engineering and work practice controls described above are not sufficient to reduce employee exposure to or below the PEL and/or excursion limit prescribed in 29 CFR 1926.1101(c), WESTON will use them to reduce employee exposure to the lowest levels attainable by these controls and

will supplement them by the use of respiratory protection that complies with the requirements of 29 CFR 1926.1101(h).

Prohibitions

The following work practices and engineering controls will not be used for work related to asbestos or for work which disturbs ACM or PACM, regardless of measured levels of asbestos exposure or the results of initial exposure assessments:

- High-speed abrasive disc saws that are not equipped with point of cut ventilator or enclosures with HEPA filtered exhaust air.
- Compressed air used to remove asbestos, or materials containing asbestos, unless the compressed air is used in conjunction with an enclosed ventilation system designed to capture the dust cloud created by the compressed air.
- Dry sweeping, shoveling or other dry clean-up of dust and debris containing ACM and PACM.
- Employee rotation as a means of reducing employee exposure to asbestos.

Class I Requirements

In addition to the provisions of 29 CFR 1926.1101(g)(1) and (2), the following engineering controls and work practices and procedures will be used:

- All Class I work, including the installation and operation of the control system will be supervised by a competent person as defined in 29 CFR 1926.1101(b);
- For all Class I jobs involving the removal of more than 25 linear or 10 square feet of thermal system insulation or surfacing material; for all other Class I jobs, where WESTON cannot produce a negative exposure assessment as provided for in 29 CFR 1926.1101(f)(2)(iii), or where employees are working in areas adjacent to the regulated area, while the Class I work is being performed, WESTON will ensure one of the following methods to ensure that airborne asbestos does not migrate from the regulated area is used:
 - WESTON will ensure that critical barriers are placed over all the openings to the regulated area, except where activities are performed outdoors; or
 - WESTON will ensure use of another barrier or isolation method which prevents the migration of airborne asbestos from the regulated area, as verified by perimeter area surveillance during each work shift at each boundary of the regulated area, showing no visible asbestos dust; and perimeter area monitoring showing that clearance levels contained in 40 CFR Part 763, Subpart. E, of the EPA Asbestos in Schools Rule are met, or that perimeter area levels, measured by Phase Contrast Microscopy (PCM) are no more than background levels representing the same area before the asbestos work began. The results of such monitoring will be made known to WESTON no later than 24 hours from the end of the work shift represented by such monitoring. Exception: For work completed outdoors where employees are not working in areas adjacent to the regulated areas, 29 CFR 1926.1101(g)(4)(ii) is satisfied when the specific control methods in 29 CFR 1926.1101(g)(5) are used.
- For all Class I jobs, HVAC systems will be isolated in the regulated area by sealing with a double layer of 6 mil plastic or the equivalent;
- For all Class I jobs, impermeable drop-cloths will be placed on surfaces beneath all removal activity;

- For all Class I jobs, all objects within the regulated area will be covered with impermeable drop-cloths or plastic sheeting which is secured by duct tape or an equivalent.
- For all Class I jobs where WESTON cannot produce a negative exposure assessment, or where exposure monitoring shows that a PEL is exceeded, the WESTON will ventilate the regulated area to move contaminated air away from the breathing zone of employees toward a HEPA filtration or collection device.

Specific Control Methods for Class I Work

In addition, WESTON will perform Class I asbestos work using one or more of the following control methods pursuant to the limitations stated below:

Negative Pressure Enclosure (NPE) Systems

NPE systems may be used where the configuration of the work area does not make the erection of the enclosure infeasible, with the following specifications and work practices:

- Specifications
 - The NPE may be of any configuration;
 - At least 4 air changes per hour must be maintained in the NPE;
 - A minimum of -0.02 column inches of water pressure differential, relative to outside pressure, must be maintained within the NPE as evidenced by manometric measurements;
 - The NPE must be kept under negative pressure throughout the period of its use; and
 - Air movement must be directed away from employees performing asbestos work within the enclosure, and toward a HEPA filtration or a collection device.
- Work Practices
 - Before beginning work within the enclosure and at the beginning of each shift, the NPE will be inspected for breaches and smoke-tested for leaks, and any leaks sealed.
 - Electrical circuits in the enclosure will be deactivated, unless equipped with ground-fault circuit interrupters.

Glove Bag Systems

Glove bag systems may be used to remove PACM and/or ACM from straight runs of piping and elbows and other connections with the following specifications and work practices:

- Specifications
 - Glove-bags must be made of 6 mil thick plastic and will be seamless at the bottom.
 - Glove-bags used on elbows and other connections must be designed for that purpose and used without modifications.
- Work Practices
 - Each glove-bag must be installed so that it completely covers the circumference of pipe or other structure where the work is to be done.
 - Glove-bags must be smoke-tested for leaks and any leaks sealed prior to use.

- Glove-bags may be used only once and may not be moved.
- Glove-bags must not be used on surfaces whose temperature exceeds 150 deg. F.
- Prior to disposal, glove-bags must be collapsed by removing air within them using a HEPA vacuum.
- Before beginning the operation, loose and friable material adjacent to the glove-bag/box operation must be wrapped and sealed in two layers of six mil plastic or otherwise rendered intact.
- Where system uses attached waste bag, such bag must be connected to collection bag using hose or other material which must withstand pressure of ACM waste and water without losing its integrity.
- A sliding valve or other device must separate waste bag from hose to ensure no exposure when waste bag is disconnected.
- At least two persons must perform Class I glove-bag removal operations.

Negative Pressure Glove Bag Systems

Negative pressure glove bag systems may be used to remove ACM or PACM from piping.

- Specifications
 - In addition to specifications for glove bag systems above, negative pressure glove bag systems must attach HEPA vacuum systems or other devices to bag to prevent collapse during removal.
- Work Practices
 - WESTON will ensure operations comply with the work practices for glove bag systems in 29 CFR 1926.1101(g)(5)(ii)(B)(4).
 - The HEPA vacuum cleaner or other device used to prevent collapse of bag during removal will run continually during the operation until it is completed at which time the bag will be collapsed prior to removal of the bag from the pipe.
 - Where a separate waste bag is used along with a collection bag and discarded after one use, the collection bag may be reused if rinsed clean with amended water before reuse.

Negative Pressure Glove Box Systems

Negative pressure glove boxes may be used to remove ACM or PACM from pipe runs with the following specifications and work practices.

- Specifications
 - Glove boxes will be constructed with rigid sides and made from metal or other material which can withstand the weight of the ACM and PACM and water used during removal;
 - A negative pressure generator will be used to create negative pressure in the system;
 - An air filtration unit will be attached to the box;
 - The box will be fitted with gloved apertures;
 - An aperture at the base of the box will serve as a bagging outlet for waste ACM and water;

- A back-up generator will be present on site;
- Waste bags will consist of 6 mil thick plastic double-bagged before they are filled or plastic thicker than 6 mil.
- Work Practices
 - At least two persons will perform the removal;
 - The box will be smoke-tested for leaks and any leaks sealed prior to each use;
 - Loose or damaged ACM adjacent to the box will be wrapped and sealed in two layers of 6 mil plastic prior to the job, or otherwise made intact prior to the job;
 - A HEPA filtration system will be used to maintain pressure barrier in box.

Water Spray Process System

A water spray process system may be used for removal of ACM and PACM from cold line piping if, employees carrying out such process have completed a 40-hour separate training course in its use, in addition to training required for employees performing Class I work. The system will meet the following specifications and work will be performed by employees using the following work practices.

- Specifications
 - Piping will be surrounded on 3 sides by rigid framing,
 - A 360 degree water spray, delivered through nozzles supplied by a high pressure separate water line, will be formed around the piping.
 - The spray will collide to form a fine aerosol which provides a liquid barrier between workers and the ACM and PACM.
- Work Practices
 - The system will be run for at least 10 minutes before removal begins.
 - All removal will take place within the water barrier.
 - The system will be operated by at least three persons, one of whom will not perform removal, but will check equipment, and ensure proper operation of the system.
 - After removal, ACM and PACM will be bagged while still inside the water barrier.

Walk-In Enclosure

A small walk-in enclosure which accommodates no more than two persons (mini-enclosure) may be used if the disturbance or removal can be completely contained by the enclosure with the following specifications and work practices.

- Specifications
 - The fabricated or job-made enclosure will be constructed of 6 mil plastic or equivalent.
 - The enclosure will be placed under negative pressure by means of a HEPA filtered vacuum or similar ventilation unit.
- Work practices
 - Before use, the mini-enclosure will be inspected for leaks and smoke-tested to detect breaches, and breaches sealed.

- Before reuse, the interior will be completely washed with amended water and HEPA-vacuumed.
- During use, air movement will be directed away from the employee's breathing zone within the mini-enclosure.

Alternative Control Methods for Class I Work

WESTON may perform Class I work using a control method which is not referenced in 29 CFR 1926.1101(g)(5), or which modifies a control method referenced in 29 CFR 1926.1101(g)(5), if the following provisions are complied with:

- The control method will enclose, contain or isolate the processes or source of airborne asbestos dust, or otherwise capture or redirect such dust before it enters the breathing zone of employees.
- A certified industrial hygienist or licensed professional engineer who is also qualified as a project designer as defined in 29 CFR 1926.1101(b), evaluates the work area, the projected work practices, and the engineering controls and certifies in writing that the planned control method is adequate to reduce direct and indirect employee exposure to below the PELs under worst-case conditions of use, and that the planned control method will prevent asbestos contamination outside the regulated area, as measured by clearance sampling which meets the requirements of EPA's Asbestos in Schools rule issued under AHERA, or perimeter monitoring which meets the criteria in 29 CFR 1926.1101(g)(4)(ii)(B).
- Where the TSI or surfacing material to be removed is 25 linear or 10 square feet or less, the evaluation required in 29 CFR 1926.1101(g)(6) may be performed by a "competent person", and may omit consideration of perimeter or clearance monitoring otherwise required.
- The evaluation of employee exposure required in 29 CFR 1926.1101(g)(6) will include and be based on sampling and analytical data representing employee exposure during the use of such method under worst-case conditions and by employees whose training and experience are equivalent to employees who are to perform the current job.

Work Practices and Engineering Controls for Class II Work

All Class II work will be supervised by a competent person as defined in 29 CFR 1926.1101(b).

For all indoor Class II jobs, where WESTON has not produced a negative exposure assessment provided for in 29 CFR 1926.1101(f)(2)(iii), or where during the job, changed conditions indicate there may be exposure above the PEL or where WESTON does not remove the ACM in a substantially intact state, WESTON will ensure use of one of the following methods so that airborne asbestos does not migrate from the regulated area:

- Critical barriers will be placed over all openings to the regulated area; or, WESTON will ensure use of another barrier or isolation method which prevents migration of airborne asbestos from the regulated area, as verified by perimeter area monitoring or clearance monitoring that meets criteria set by 29 CFR 1926.1101. (g)(4)(ii)(B).
- Impermeable drop-cloths will be placed on surfaces beneath all removal activity.
- All Class II asbestos work will be performed using the work practices and requirements set out in 29 CFR 1926.1101(g)(1)(i) through (g)(1)(iii).

Additional Controls for Class II Work

Class II asbestos work may also be performed by complying with the work practices and controls designated for each type of asbestos work to be performed, set out in 29 CFR 1926.1101. Where more than one control method may be used for a type of asbestos work, WESTON may choose one or a combination of designated control methods. Class II work also may be performed using a method allowed for Class I work, except that glove bags and glove boxes are allowed if they fully enclose the Class II material to be removed.

Flooring

For removing vinyl and asphalt flooring materials which contain ACM or for which in buildings constructed no later than 1980, and WESTON has not verified the absence of ACM as in 29 CFR 1926.1101(g)(8)(i)(I), WESTON will ensure that employees comply with the following work practices and are trained in these practices in accordance with 29 CFR 1926.1101(k)(9).

- Flooring or its backing will not be sanded.
- Vacuums equipped with HEPA filter, disposable dust bag, and metal floor tool (no brush) will be used to clean floors.
- Resilient sheeting will be removed by cutting with wetting of the snip point and wetting during de-lamination. Rip-up of resilient sheet floor material is prohibited.
- All scraping of residual adhesive and/or backing will be performed using wet methods.
- Dry sweeping is prohibited.
- Mechanical chipping is prohibited unless performed in a negative pressure enclosure which meets the requirements of 29 CFR 1926.1101(g)(5)(i).
- Tiles will be removed intact, unless WESTON demonstrates that intact removal is not possible.
- When tiles are heated and can be removed intact, wetting may be omitted.
- Resilient flooring material including associated mastic and backing will be assumed to be asbestos-containing unless an industrial hygienist determines that it is asbestos-free using recognized analytical techniques.

Roofing

For removing roofing material which contains ACM, WESTON will ensure that the following work practices are followed:

- Roofing material will be removed in an intact state to the extent feasible.
- Wet methods will be used to remove roofing materials that are not intact, or that will be rendered not intact during removal, unless wet methods are not feasible or will create safety hazards.
- Cutting machines will be continuously misted during use, unless a competent person determines that misting substantially decreases worker safety.
- When removing built-up roofs with asbestos-containing roofing felts and an aggregate surface using a power roof cutter, all dust resulting from the cutting operation will be collected by a HEPA dust collector, or will be HEPA vacuumed by vacuuming along the cut line. When removing built-up roofs with asbestos-containing roofing felts and a smooth surface using a power roof cutter, the dust resulting from the cutting operation will be collected either by a HEPA

dust collector or HEPA vacuuming along the cut line, or by gently sweeping and then carefully and completely wiping up the still-wet dust and debris left along the cut line.

- Asbestos-containing material that has been removed from a roof will not be dropped or thrown to the ground. Unless the material is carried or passed to the ground by hand, it will be lowered to the ground via covered, dust-tight chute, crane or hoist.
- Any ACM that is not intact will be lowered to the ground as soon as is practicable, but in any event no later than the end of the work shift. While the material remains on the roof it will either be kept wet, placed in an impermeable waste bag, or wrapped in plastic sheeting.
- Intact ACM will be lowered to the ground as soon as is practicable, but in any event no later than the end of the work shift.
- Upon being lowered, unwrapped material will be transferred to a closed receptacle in such manner so as to preclude the dispersion of dust.
- Roof level heating and ventilation air intake sources will be isolated or the ventilation system will be shut down.
- Notwithstanding any other provision of this section, removal or repair of sections of intact roofing less than 25 square feet in area does not require use of wet methods or HEPA vacuuming as long as manual methods which do not render the material non-intact are used to remove the material and no visible dust is created by the removal method used. In determining whether a job involves less than 25 square feet, WESTON will include all removal and repair work performed on the same roof on the same day.

Siding, Shingles, or Transite Panels

When removing cementitious asbestos-containing siding and shingles or transite panels containing ACM on building exteriors other than roofs [see above and 29 CFR 1926.1101(g)(8)(ii)], WESTON will ensure that the following work practices are followed:

- Cutting, abrading or breaking siding, shingles, or transite panels, will be prohibited unless the employer can demonstrate that methods less likely to result in asbestos fiber release cannot be used.
- Each panel or shingle will be sprayed with amended water prior to removal.
- Unwrapped or unbagged panels or shingles will be immediately lowered to the ground via covered dust-tight chute, crane or hoist, or placed in an impervious waste bag or wrapped in plastic sheeting and lowered to the ground no later than the end of the work shift.
- Nails will be cut with flat, sharp instruments.

Gaskets

When removing gaskets containing ACM, WESTON will ensure that the following work practices are followed:

- If a gasket is visibly deteriorated and unlikely to be removed intact, removal will be undertaken within a glove-bag as described in 29 CFR 1926.1101(g)(5)(ii).
- The gasket will be immediately placed in a disposal container.
- Any scraping to remove residue will be performed wet.

Other Class II Removal

When performing any other Class II removal of ACM for which specific controls have not been listed in 29 CFR 1926.1101(g)(8)(iv)(A) through (D), WESTON will ensure compliance with the following work practices:

- The material will be thoroughly wetted with amended water prior to and during its removal.
- The material will be removed in an intact state unless WESTON demonstrates that intact removal is not possible.
- Cutting, abrading or breaking the material will be prohibited unless WESTON can demonstrate that methods less likely to result in asbestos fiber release are not feasible.
- Asbestos-containing material removed will be immediately bagged or wrapped, or kept wetted, until transferred to a closed receptacle, no later than the end of the work shift.

Alternative Work Practices and Controls

Instead of the work practices and controls listed in 29 CFR 1926.1101(g)(8)(i) through (v), WESTON may use different or modified engineering and work practice controls if the following provisions are complied with:

- WESTON can demonstrate by data representing employee exposure during the use of such method under conditions which closely resemble the conditions under which the method is to be used, that employee exposure will not exceed the PELs under any anticipated circumstances.
- A competent person evaluates the work area, the projected work practices and the engineering controls, and will certify in writing, that the different or modified controls are adequate to reduce direct and indirect employee exposure to below the PELs under all expected conditions of use and that the method meets the requirements of 29 CFR 1926.1101. The evaluation will include and be based on data representing employee exposure during the use of such method under conditions which closely resemble the conditions under which the method is to be used for the current job, and by employees whose training and experience are equivalent to employees who are to perform the current job.

Work Practices and Engineering Controls for Class III Asbestos Work

Class III asbestos work will be conducted using engineering and work practice controls which minimize the exposure to employees performing the asbestos work and to bystander employees.

- The work will be performed using wet methods.
- To the extent feasible, the work will be performed using local exhaust ventilation.
- Where the disturbance involves drilling, cutting, abrading, sanding, chipping, breaking, or sawing of thermal system insulation or surfacing material, WESTON will ensure use of impermeable drop-cloths, and isolation of the operation using mini-enclosures or glove bag systems as in 29 CFR 1926.1101(g)(5) or another isolation method.
- Where WESTON has not produced a negative exposure assessment for a job, or where monitoring results show the PEL has been exceeded, WESTON will ensure containment of the area using impermeable drop-cloths and plastic barriers or their equivalent, or will ensure isolation of the operation using a control system listed in and in compliance 29 CFR 1926.1101(g)(5).

- Employees performing Class III jobs, which involve the disturbance of thermal system insulation or surfacing material, or where WESTON has not produced a negative exposure assessment, or where monitoring results show a PEL has been exceeded, will wear respirators which are selected, used and fitted pursuant to provisions of 29 CFR 1926.1101(h).

Class IV Asbestos Work

Class IV asbestos jobs will be conducted by employees trained pursuant to the asbestos awareness training program set out in 29 CFR 1926.1101(k)(9). In addition, all Class IV jobs will be conducted in conformity with the requirements set out in 29 CFR 1926.1101(g)(1), mandating wet methods, HEPA vacuums, and prompt clean up of debris containing ACM or PACM.

- Employees cleaning up debris and waste in a regulated area where respirators are required will wear respirators which are selected, used and fitted pursuant to provisions of 29 CFR 1926.1101(h).
- Employers of employees who clean up waste and debris in, and employers in control of, areas where friable thermal system insulation or surfacing material is accessible, will assume that such waste and debris contain asbestos.

Alternative Methods of Compliance for Installation, Removal, Repair, and Maintenance of Certain Roofing and Pipeline Coating Materials

Notwithstanding any other provision of 29 CFR 1926.1101, WESTON will comply with all provisions of 29 CFR 1926.1101(g)(11) when installing, removing, repairing, or maintaining intact pipeline asphaltic wrap, or roof flashings which contain asbestos fibers encapsulated or coated by bituminous or resinous compounds and will be deemed to be in compliance with 29 CFR 1926.1101. If WESTON does not comply with all provisions of 29 CFR 1926.1101(g)(11) or if during the course of the job the material does not remain intact, the provisions of 29 CFR 1926.1101(g)(8) will be used instead of 29 CFR 1926.1101(g)(11).

- Before work begins and as needed during the job, a competent person who is capable of identifying asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, and who has the authority to take prompt corrective measures to eliminate such hazards, will conduct an inspection of the worksite and determine that the roofing material is intact and will likely remain intact.
- All employees performing work covered by 29 CFR 1926.1101(g)(11) will be trained in a training program that meets the requirements of 29 CFR 1926.1101(k)(9)(viii).
- The material will not be sanded, abraded, or ground. Manual methods which do not render the material non-intact will be used.
- Material that has been removed from a roof will not be dropped or thrown to the ground. Unless the material is carried or passed to the ground by hand, it will be lowered to the ground via covered, dust-tight chute, crane or hoist. All such material will be removed from the roof as soon as is practicable, but in any event no later than the end of the work shift.
- Where roofing products which have been labeled as containing asbestos according to 29 CFR 1926.1101(k)(8) are installed on non-residential roofs during operations covered by 29 CFR 1926.1101(g)(11), WESTON will ensure the building owner is notified of the presence and location of such materials no later than the end of the job.
- All removal or disturbance of pipeline asphaltic wrap will be performed using wet methods.

Respiratory Protection

No employee will be assigned to asbestos work that requires respirator use if, based on their most recent medical examination, the examining physician determines that the employee will be unable to function normally while using a respirator, or that the safety or health of the employee or other employees will be impaired by the employee's respirator use. Such employees must be assigned to another job or given the opportunity to transfer to a different position that they can perform. If such a transfer position is available, it must be with the same employer, in the same geographical area, and with the same seniority, status, rate of pay, and other job benefits the employee had just prior to such transfer.

Respirator Use

Respiratory Protection will be used in accordance with WESTON's Respiratory Protection Program, in compliance with 29 CFR 1910.134 and under the following conditions:

- During the interval necessary to install or implement feasible engineering and work practice controls;
- In work operations, such as maintenance and repair activities, or other activities for which engineering and work practice controls are not feasible;
- In work situations where feasible engineering and work practice controls are not yet sufficient to reduce exposure to or below the TWA and/or excursion limit;
- During all Class I asbestos jobs;
- During all Class II and III asbestos jobs where a "negative exposure assessment" has not been produced;
- During all Class III jobs where TSI or surfacing ACM or PACM is being disturbed;
- Class IV asbestos work performed within regulated areas where employees who are performing other work are required to use respirators;
- During all work covered by 29 CFR 1926.1101 where employees are exposed above the TWA or excursion limit; and
- In emergencies.

Each employee who uses a filter respirator for protection will be permitted to change the filter elements whenever an increase in breathing resistance is detected and WESTON will maintain an adequate supply of filter elements for this purpose.

Employees who wear respirators will be permitted to leave work areas to wash their faces and respirator facepieces whenever necessary to prevent skin irritation associated with respirator use.

Respirator Selection

Where respirators are required this plan and 29 CFR 1926.1101, the appropriate respirator specified in Table 1 will be used.

NOTE: Filtering facepiece (Dust Mask) respirators are prohibited for protection from asbestos.

TABLE 1. RESPIRATORY PROTECTION FOR ASBESTOS FIBERS

Type of Respirator ^{1, 2}	Quarter Mask	Half Mask	Full Facepiece	Helmet/Hood	Loose-fitting Facepiece
1. Air-Purifying Respirator (APR)	5	10 ³	50		
2. Powered Air-Purifying Respirator (PAPR)		50	1,000	25/1,000 ⁴	25
3. Supplied-Air Respirator (SAR) or Airline Respirator					
• Demand mode		10	50		
• Continuous flow mode		50	1,000	25/1,000 ⁴	25
• Pressure-demand or other positive-pressure mode		50	1,000		
4. Self-Contained Breathing Apparatus (SCBA)					
• Demand mode		10	50	50	
• Pressure-demand or other positive-pressure mode (e.g., open/closed circuit)			10,000	10,000	

Notes:

These APFs do not apply to respirators used solely for escape. For escape respirators used in association with specific substances covered by 29 CFR 1910 Subpart Z, WESTON will refer to the appropriate substance-specific standards in that subpart. Escape respirators for other IDLH atmospheres are specified by 29 CFR 1910.134 (d)(2)(ii).

1. WESTON may select respirators assigned for use in higher workplace concentrations of a hazardous substance for use at lower concentrations of that substance, or when required respirator use is independent of concentration.
2. The assigned protection factors in Table 1 are only effective when used in conjunction with WESTON's continuing, effective Respiratory Protection Program as required by 29 CFR 1910.134 which includes training, fit testing, maintenance, and use requirements.
3. This APF category includes filtering face pieces, and half masks with elastomeric face pieces.
4. WESTON will have evidence provided by the respirator manufacturer that testing of these respirators demonstrates performance at a level of protection of 1,000 or greater to receive an APF of 1,000. This level of performance can best be demonstrated by performing a WPF or SWPF study or equivalent testing. Absent such testing, all other PAPRs and SARs with helmets/hoods are to be treated as loose-fitting face piece respirators, and receive an APF of 25.

WESTON will provide a powered, air purifying respirator (APR) in lieu of any negative pressure respirator specified in Table 1 whenever an employee chooses to use this type of respirator; and this respirator will provide adequate protection to the employee.

WESTON will provide a half-mask APR, other than a disposable respirator, that is equipped with high-efficiency filters when the employee performs:

- Class II and III asbestos work and a negative-exposure assessment have not been conducted.
- Class III asbestos work when TSI or surfacing ACM or PACM is being disturbed.

In addition to the above selection criteria, when employees are in a regulated area where Class I work is being performed, a negative exposure assessment of the area has not been produced, and the exposure assessment of the area indicates the exposure level will not exceed 1 f/cc as an 8-hour TWA, WESTON will ensure employees are provided with one of the following respirators:

- A tight-fitting powered APR equipped with high efficiency filters; or
- A full face-piece SAR operated in the pressure-demand mode equipped with HEPA egress cartridges.

Note: A high efficiency or P, N, or R 100 filter means a filter that is at least 99.97% efficient against mono-dispersed particles of 0.3 micrometers in diameter or larger.

Whenever employees are working in a regulated area performing Class I work where a negative exposure assessment is not available and the exposure assessment indicates that the exposure level will be above 1 f/cc as an 8-hour TWA, a full face piece supplied-air respirator operated in the pressure-demand mode equipped with an auxiliary positive pressure self-contained breathing apparatus will be provided.

Respirators must be those certified as acceptable for protection by the NIOSH.

Qualitative fit-tests (QLFT) protocols may only be used for fit-testing negative pressure air purifying respirators that must achieve a fit factor of 10 or less.

Protective Work Clothing and Equipment

WESTON will provide personal protective equipment and ensure that it is used according to WESTON's Personal Protective Equipment program whenever employees are:

- Exposed to asbestos above the TWA and/or the excursion limit, or;
- Exposed to asbestos for which a required negative exposure assessment is not produced, or;
- Performing Class I operations that involves the removal of over 25 linear or 10 square feet of TSI or surfacing ACM and PACM, procedures will be implemented to ensure that employees use appropriate protective work clothing.

WESTON's Personal Protective Equipment program conforms to applicable standards and specifications and includes, but is not limited to, coveralls or similar full-body work clothing, gloves, head coverings, and foot coverings.

Laundering

WESTON will ensure that contaminated reusable clothing is laundered to prevent the release of airborne asbestos in excess of the TWA or excursion limit prescribed in 29 CFR 1926.1101(c).

If contaminated clothing is given to another person for laundering, WESTON will ensure such person is informed of the requirement in 29 CFR 1926.1101(i)(2)(i) to effectively prevent the release of airborne asbestos in excess of the TWA and excursion limit prescribed in 29 CFR 1926.1101(c).

Contaminated Clothing

Contaminated clothing will be transported in sealed impermeable bags, or other closed, impermeable containers, and be labeled in accordance with 29 CFR 1926.1101(k).

Inspection of Protective Clothing

The competent person will examine work suits worn by employees at least once per work shift for rips or tears that may occur during performance of work. When rips or tears are detected while an employee is working, rips and tears will be immediately mended, or the work suit will be immediately replaced.

Hygiene Facilities and Practices for Employees (applicable to jobs involving over 25 linear or 10 square feet of TSI or surfacing ACM and PACM)

WESTON will ensure compliance with the following requirements for employees performing Class I asbestos jobs involving over 25 linear or 10 square feet of TSI or surfacing ACM and PACM.

Decontamination Areas

WESTON will ensure a decontamination area is established that is adjacent to and connected to the regulated area for the decontamination of employees who have been in the regulated area. The decontamination area will consist of an equipment room, shower area, and clean room in series. WESTON will ensure that employees enter and exit the regulated area through the decontamination area.

Equipment Room

The equipment room will be supplied with impermeable, labeled bags and containers for the containment and disposal of contaminated protective equipment.

Shower Area

WESTON will provide shower facilities which comply with 29 CFR 1910.141(d)(3), unless WESTON can demonstrate that they are not feasible. The showers will be adjacent both to the equipment room and the clean room, unless WESTON can demonstrate that this location is not feasible. Where WESTON can demonstrate that it is not feasible to locate the shower between the equipment room and the clean room, or where the work is performed outdoors, WESTON will ensure that employees:

Remove asbestos contamination from their work suits in the equipment room using a HEPA vacuum before proceeding to a shower that is not adjacent to the work area; or

Remove their contaminated work suits in the equipment room, then don clean work suits, and proceed to a shower that is not adjacent to the work area.

Clean Change Room

The clean room will be equipped with a locker or appropriate storage container for each employee's use. When WESTON can demonstrate that it is not feasible to provide a clean change area adjacent to the work area or where the work is performed outdoors, WESTON may permit employees engaged in Class I asbestos jobs to clean their protective clothing with a portable HEPA-equipped vacuum before these employees leave the regulated area. Following showering, these employees, however, must then change into street clothing in clean change areas provided by WESTON which otherwise meets the requirements of 29 CFR 1926.1101.

Decontamination Area Entry Procedures

WESTON will ensure that employees:

- (a) Enter the decontamination area through the clean room;
- (b) Remove and deposit street clothing within a locker provided for their use; and
- (c) Put on protective clothing and respiratory protection before leaving the clean room.
- (d) Employees pass through the equipment room before entering the regulated area.

Decontamination Area Exit Procedures

WESTON will ensure that employees will:

- (a) Remove all gross contamination and debris from their protective clothing before leaving the regulated area.
- (b) Remove their protective clothing in the equipment room and deposit the clothing in labeled impermeable bags or containers.
- (c) Not remove their respirators in the equipment room.
- (d) Shower prior to entering the clean room.
- (e) Enter the clean room before changing into street clothes, after showering.

Lunch Areas

Whenever food or beverages are consumed at the worksite where employees are performing Class I asbestos work, WESTON will ensure lunch areas are provided in which the airborne concentrations of asbestos are below the permissible exposure limit and/or excursion limit.

Hygiene Facilities and Practices for Employees (applicable to jobs involving less than 25 linear or 10 square feet of TSI or surfacing ACM and PACM and Class II and Class III asbestos work as specified below)

WESTON will ensure compliance with requirements for Class I work involving less than 25 linear or 10 square feet of TSI or surfacing ACM and PACM, and for Class II and Class III asbestos work operations where exposures exceed a PEL, or where there is no negative exposure assessment produced before the operation.

Equipment Room/Area for Decontamination

WESTON will ensure that an equipment room (or area that is adjacent to the regulated area) is established for the decontamination of employees and their equipment which is contaminated with asbestos. The equipment room/area will consist of an area covered by an impermeable drop cloth on the floor or horizontal working surface.

The area must be of sufficient size to accommodate cleaning of equipment and removing personal protective equipment without spreading contamination beyond the area (as determined by visible accumulations).

Work clothing must be cleaned with a HEPA vacuum before it is removed.

All equipment and surfaces of containers filled with ACM must be cleaned prior to removing them from the equipment room or area.

WESTON will ensure that employees enter and exit the regulated area through the equipment room or area.

Hygiene Facilities and Practices for Employees (applicable to Class IV work)

WESTON will ensure that employees performing Class IV work within a regulated area comply with the hygiene practice required of employees performing work which has a higher classification within that regulated area. Otherwise WESTON will ensure employees cleaning up debris and material which is TSI or surfacing ACM or identified as PACM are provided decontamination facilities which are required by 29 CFR 1926.1101(j)(2).

Smoking in Work Areas

WESTON will ensure that employees do not smoke in work areas where they are occupationally exposed to asbestos because of activities in that work area.

Communication of Hazards

This section applies to the communication of information concerning asbestos hazards in construction activities to facilitate compliance with 29 CFR 1926.1101. Most asbestos-related construction activities involve previously installed building materials. Building owners often are the only and/or best sources of information concerning them. Therefore, they, along with WESTON, are assigned specific information conveying and retention duties under this section.

Duties of Building and Facility Owners

Before work subject to this standard is begun, WESTON will confirm through reviews of hard data by a competent person that acceptable surveys have been conducted by building and facility owners to determine the presence, location, and quantity of ACM and/or PACM at the work site pursuant to 29 CFR 1926.1101(k)(1) unless it has been determined in compliance with 29 CFR 1926.1101(k)(5) that the material is not asbestos-containing.

WESTON will ensure that building and/or facility owners have notified in writing the following persons of the presence, location and quantity of ACM or PACM, at the work sites in their buildings and facilities:

Prospective employers applying or bidding for work whose employees reasonably can be expected to work in or adjacent to areas containing such material;

Employees of the owner who will work in or adjacent to areas containing such material:

On multi-employer worksites, all employers of employees who will be performing work within or adjacent to areas containing such materials;

Tenants who will occupy areas containing such material.

Duties of WESTON when Employees Perform Work Subject to 29 CFR 1926.1101 in or Adjacent to Areas Containing ACM and PACM

Before work in areas containing ACM and PACM is begun; WESTON will ensure the presence, location, and quantity of ACM, and/or PACM therein has been determined and documented according to 29 CFR 1926.1101(k)(1).

Before work under 29 CFR 1926.1101 is performed, WESTON will ensure the following persons are informed of the location and quantity of ACM and/or PACM present in the area and the precautions to be taken to insure that airborne asbestos is confined to the area:

- Owners of the building/facility.
- Employees who will perform such work and employers of employees who work and/or will be working in adjacent areas.

Within 10 days of the completion of such work, WESTON will inform the building/facility owner and employers of employees who will be working in the area of the current location and quantity of PACM and/or ACM remaining in the area and final monitoring results, if any.

In addition to the above requirements, if WESTON discovers ACM and/or PACM on a worksite WESTON will convey information concerning the presence, location and quantity of such newly discovered ACM and/or PACM to the owner and to other employers of employees working at the work site, within 24 hours of the discovery.

Criteria to Rebut the Designation of Installed Material as PACM

At any time, WESTON and/or a building owner may demonstrate, for purposes of 29 CFR 1926.1101, that PACM does not contain asbestos. Building owners and/or WESTON are not required to communicate information about the presence of building material for which such a demonstration pursuant to the requirements of 29 CFR 1926.1101(k)(5)(ii) has been made. However, in all such cases, the information, data and analysis supporting the determination that PACM does not contain asbestos, must be retained as required by 29 CFR 1926.1101(n). WESTON will require written documentation of this determination to be reviewed by a competent person.

WESTON may demonstrate that PACM does not contain more than 1 percent asbestos by the following:

- Having a completed inspection conducted pursuant to the requirements of AHERA (40 CFR Part 763, Subpart E) which demonstrates that the material is not ACM; or
- Performing a survey by an accredited inspector to include tests of the material containing PACM which demonstrate that no ACM is present in the material. Such tests will include analysis of bulk samples collected in the manner described in 40 CFR 763.86. The tests, evaluation, and sample collection will be conducted by an accredited inspector or by a CIH. Analysis of samples will be performed by persons or laboratories with proficiency demonstrated by current successful participation in a nationally recognized testing program such as the National Voluntary Laboratory Accreditation Program (NVLAP) or the National Institute for Standards and Technology (NIST) or the Round Robin for bulk samples administered by the American Industrial Hygiene Association (AIHA) or an equivalent nationally-recognized round robin testing program.

WESTON and/or a building owner may demonstrate that flooring material including associated mastic and backing does not contain asbestos, by a determination of an industrial hygienist based upon recognized analytical techniques showing that the material is not ACM. This demonstration will be documented in writing and acceptable to WESTON.

Signs

At the entrance to mechanical rooms/areas in which employees reasonably can be expected to enter and which contain ACM and/or PACM, WESTON will ensure that signs are posted which identify the material which is present, its location, and appropriate work practices which, if followed, will ensure that ACM and/or PACM will not be disturbed. WESTON will ensure, to the extent feasible, that employees who come in contact with these signs can comprehend them. Means to ensure employee comprehension may include the use of foreign languages, pictographs, graphics, and awareness training.

WESTON will ensure that warning signs that demarcate the regulated area will be provided and displayed at each location where a regulated area is required to be established by 29 CFR 1926.1101(e). Signs will be posted at such a distance from these locations that an employee may read the signs and take necessary protective steps before entering the area marked by the signs.

The warning signs required by 29 CFR 1926.1101(k)(7) will bear the following information.

**DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY**

In addition, where the use of respirators and protective clothing are required in the regulated area, the warning signs will include the following:

RESPIRATORS AND PROTECTION CLOTHING ARE REQUIRED IN THIS AREA

WESTON will ensure that employees working in and contiguous to regulated areas comprehend the warning signs required to be posted by 29 CFR 1926.1101(k)(7)(i). Means to ensure employee comprehension may include the use of foreign languages, pictographs and graphics.

Labels

WESTON will ensure that labels are affixed to all products containing asbestos and to all containers containing such products, including waste containers. Where feasible, installed asbestos products will contain a visible label.

Labels will be printed in large, bold letters on a contrasting background.

Labels will be used in accordance with the requirements of 29 CFR 1910.1200(f) of OSHA's Hazard Communication standard, and will contain the following information:

**DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD**

Labels will contain a warning statement against breathing asbestos fibers.

The provisions for labels required by 29 CFR 1926.1101(k)(8)(i) through (k)(8)(iii) do not apply where:

- (1) Asbestos fibers have been modified by a bonding agent, coating, binder, or other material, provided that the manufacturer can demonstrate that, during any reasonably foreseeable use, handling, storage, disposal, processing, or transportation, no airborne concentrations of asbestos fibers in excess of the permissible exposure limit and/or excursion limit will be released, or
- (2) Asbestos is present in a product in concentrations less than 1.0 percent.
- (3) When a building owner or WESTON identifies previously installed PACM and/or ACM, WESTON will ensure labels or signs are affixed or posted so that employees will be notified of what materials contain PACM and/or ACM. WESTON will ensure such labels are attached in areas where they will clearly be noticed by employees who are likely to be exposed, such as at the entrance to mechanical room/areas. Signs required by 29 CFR 1926.1101(k)(6) may be posted in lieu of labels provided they contain information required for labeling. WESTON will ensure, to the extent feasible, that employees who come in contact with these signs or labels can comprehend them. Means to ensure employee comprehension may include the use of foreign languages, pictographs, graphics, and awareness training.

Employee Information and Training

WESTON will, at no cost to the employee, institute a training program for all employees who are likely to be exposed in excess of a PEL and for all employees who perform Class I through IV asbestos operations, and will ensure their participation in the program.

Training will be provided prior to or at the time of initial assignment and at least annually thereafter.

Training for Class I operations and for Class II operations that require the use of critical barriers (or equivalent isolation methods) and/or negative pressure enclosures under this section will be the equivalent in curriculum, training method and length to the EPA Model Accreditation Plan (MAP) asbestos abatement workers training (40 CFR Part 763, subpart E, appendix C).

Training for other Class II work

- (1) For work with asbestos-containing roofing materials, flooring materials, siding materials, ceiling tiles, or transite panels, training will include at a minimum all the elements included in 29 CFR 1926.1101(k)(9)(viii), and in addition, the specific work practices and engineering controls set forth in 1926.1101(g) which specifically relate to that category. Such course will include "hands-on" training and will take at least 8 hours.
- (2) An employee who works with more than one of the categories of material specified in 29 CFR 1926.1101(k)(9)(iv)(A) will receive training in the work practices applicable to each category of material that the employee removes and each removal method that the employee uses.
- (3) For Class II operations not involving the categories of material specified in 29 CFR 1926.1101(k)(9)(iv)(A), training will be provided which will include at a minimum all the elements included in 29 CFR 1926.1101(k)(9)(viii) as well as, the specific work practices and engineering controls set forth in 29 CFR 1926(g) which specifically relate to the category of material being removed, and will include "hands-on" training in the work practices applicable to each category of material that the employee removes and each removal method that the employee uses.

Training for Class III employees will be consistent with EPA requirements for training of local education agency maintenance and custodial staff as set forth at 40 CFR 763.92(a)(2). This course will also include "hands-on" training and will take at least 16 hours.

Exception: For Class III operations for which the competent person determines that the EPA curriculum does not adequately cover the training needed to perform that activity, training will include as a minimum all the elements included in 29 CFR 1926.1101(k)(9)(viii) and in addition, the specific work practices and engineering controls set forth in 29 CFR 1926.1101(g) which specifically relate to that activity, and will include "hands-on" training in the work practices applicable to each category of material that the employee disturbs.

Training for employees performing Class IV operations will be consistent with EPA requirements for training of local education agency maintenance and custodial staff as set forth at 40 CFR 763.92(a)(1). This course will include available information concerning the locations of thermal system insulation and surfacing ACM/PACM, and asbestos-containing flooring material, or flooring material where the absence of asbestos has not yet been certified; and instruction in recognition of damage, deterioration, and delamination of asbestos containing building materials. Such course will take at least 2 hours.

Training for employees who are likely to be exposed in excess of the PEL and who are not otherwise required to be trained under 29 CFR 1926.1101(k)(9)(iii) through (vi), will meet the requirements of 29 CFR 1926.1101 (k)(9)(viii).

Training Program

The training program will be conducted in a manner that the employee is able to understand. In addition to the content required in 29 CFR 1926.1101(k)(9)(iii) through (vi), WESTON will ensure that each such employee is informed of the following:

- Methods of recognizing asbestos, including the requirement in 29 CFR 1926.1101(k)(1) to presume that certain building materials contain asbestos;
- The health effects associated with asbestos exposure;
- The relationship between smoking and asbestos in producing lung cancer;
- The nature of operations that could result in exposure to asbestos, the importance of necessary protective controls to minimize exposure including, as applicable, engineering controls, work practices, respirators, housekeeping procedures, hygiene facilities, protective clothing, decontamination procedures, emergency procedures, and waste disposal procedures, and any necessary instruction in the use of these controls and procedures; where Class III and IV work will be or is performed, the contents of EPA 20T-2003, "Managing Asbestos In-Place" July 1990 or its equivalent in content;
- The purpose, proper use, fitting instructions, and limitations of respirators as required by 29 CFR 1910.134;
- The appropriate work practices for performing the asbestos job;
- Medical surveillance program requirements;
- The content of this standard including appendices;
- The names, addresses and phone numbers of public health organizations which provide information, materials and/or conduct programs concerning smoking cessation. WESTON may

distribute the list of such organizations contained in Appendix J of 29 CFR 1926.1101, to comply with this requirement; and

- The requirements for posting signs and affixing labels and the meaning of the required legends for such signs and labels.

Access to Training Materials

WESTON will make readily available to affected employees without cost, written materials relating to the employee training program, including a copy of this regulation.

WESTON will provide to the Assistant Secretary and the Director, upon request, all information and training materials relating to the employee information and training program.

WESTON will inform all employees concerning the availability of self-help smoking cessation program material. Upon employee request, WESTON will distribute such material, consisting of NIH Publication No, 89-1647, or equivalent self-help material, approved or published by a public health organization listed in Appendix J to 29 CFR 1926.1101.

WESTON will also provide, at no cost to employees who perform housekeeping operations in an area which contains ACM or PACM, an asbestos awareness training course, which shall at a minimum contain the following elements:

- health effects of asbestos
- locations of ACM and PACM in the building/facility
- recognition of ACM and PACM damage and deterioration
- requirements in this standard relating to housekeeping
- proper response to fiber release episodes

Each such employee shall be so trained at least once a year.

Housekeeping

Where vacuuming methods are selected, WESTON will ensure that HEPA filtered vacuuming equipment is used. The equipment will be used and emptied in a way that minimizes the reentry of asbestos into the workplace.

Waste Disposal

WESTON will ensure that asbestos waste, scrap, debris, bags, containers, equipment, and contaminated clothing consigned for disposal is collected and disposed of in sealed, labeled, impermeable bags or other closed, labeled, impermeable containers except in roofing operations where the procedures specified in 29 CFR 1926.1101(g)(8)(ii) apply.

Care of Asbestos-containing Flooring Material

WESTON will ensure that all vinyl and asphalt flooring material is maintained according to 29 CFR 1926.1101 unless the building/facility owner demonstrates, per 29 CFR 1926.1101(g)(8)(i)(I) that the flooring does not contain asbestos. WESTON will also ensure that:

- Sanding of flooring material is prohibited.
- Stripping of finishes will be conducted using low abrasion pads at speeds lower than 300 rpm and wet methods.
- Burnishing or dry buffing may be performed only on flooring which has sufficient finish so that the pad cannot contact the flooring material.

WESTON will ensure that waste and debris and accompanying dust in an area containing accessible thermal system insulation, surfacing ACM/PACM, or visibly deteriorated ACM:

- will not be dusted or swept dry, or vacuumed without using a HEPA filter
- will be promptly cleaned up and disposed of in leak tight containers

Medical Monitoring

WESTON has a very comprehensive and progressive Health and Safety program. This includes a medical surveillance program for all employees who are or will be exposed to airborne concentrations of fibers of asbestos at or above the TWA and/or excursion limit. The effectiveness of this program has been verified through evaluation of results of WESTON's medical monitoring program.

A fully qualified Medical Contractor and Medical Director are integral parts of this program which is based upon demonstrated familiarity with the type of work that WESTON does. The medical evaluation for asbestos workers is provided by and under the direction of highly qualified Board Certified Occupational Physicians. The evaluation is consistent with and certifies employees to work with asbestos according to 29 CFR 1910.1001 and 1926.1101 and to wear respiratory protection according to 29 CFR 1910.134.

WESTON provides medical evaluations as part of the hiring process of workers in several categories as well as at a recurrent frequency based on the work performed. The purpose of WESTON's asbestos medical monitoring program is to:

- Determine WESTON workers fitness to work.
- Monitor health status in conformance with OSHA regulations for asbestos workers.
- Monitor effectiveness of WESTON's Health and Safety Program for asbestos workers.

Employees Covered

Before an employee is assigned to work where airborne concentrations of asbestos fibers may be at or above the TWA and/or excursion limit, a pre-placement medical examination is provided.

The medical evaluations also comply with OSHA 29 CFR 1910.120, Hazardous Waste Site Worker; 29 CFR 1910.1001 and 29 CFR 1926.1101, for asbestos medical monitoring requirements; and 29 CFR 1910.1450 for exposure to hazardous chemicals.

The Initial/Exit and Periodic Protocol Examinations for these workers are used to initially certify and then periodically re-certify WESTON workers as medically fit to perform the jobs at the level of effort described below:

- Asbestos workers are employees who for a combined total of 30 or more days per year are engaged in Class I, II, and III work or are exposed at or above a PEL. For purposes of 29 CFR 1926.1101, any day in which a worker engages in Class II or Class III operations or a combination thereof on intact material for one hour or less (taking into account the entire time

spent on the removal operation, including cleanup) and, while doing so, adheres fully to the work practices specified in this standard, will not be counted. WESTON has instituted a medical surveillance program for these employees.

- The program determines fitness to work for employees who work with asbestos.
- Asbestos workers may have to perform a variety of tasks ranging from manual labor such as light to moderate lifting; driving; climbing and working at elevation; to simply observing the activities of other workers. The job assignment of asbestos workers will often determine frequency of lifting and weights of objects to be lifted.
- Many asbestos workers will also require certification to work on hazardous materials sites or in laboratories. All asbestos workers are medically evaluated and qualified to wear respiratory protection as required by 29 CFR 1910.134.

Examination Content

(1) Initial/Exit Protocol

(a) The Initial/Exit Protocol, medical examination will normally be given as:

- (i) An entrance examination;
- (ii) At exit from potentially hazardous positions; and
- (iii) Termination from WESTON.

(b) The content of the initial and exit examination is provided in Appendix B of this Program.

(2) Periodic Protocol

(a) The Periodic Protocol examination will be used for annual assessments for all employees involved in hazardous materials site, asbestos, laboratory, and construction work.

(b) The content of the periodic examination is provided in Appendix B of this Program.

(3) Frequency

All items listed under the Initial/Exit and Periodic Protocols described above will be administered annually except as stated below:

CHEST X-RAY - one view (PA only): A PA Chest X-ray is required for all entry and exit examinations and periodically as indicated below:

ASBESTOS workers Chest X-Ray frequency is every two years (unless the worker is over 45 or the employees work with asbestos began more than 10 years ago)

Asbestos workers X-rays must be given a "B" reading.

(4) Information Provided to the Physician

(a) WESTON has provided the following information to the examining physician:

- (i) A copy of 29 CFR 1926.1101 and Appendices D and E of the standard.
- (ii) A description of the affected employee's duties as they relate to the employee's exposure.
- (iii) The employee's representative exposure level or anticipated exposure level.

- (iv) A description of any personal protective and respiratory equipment used or to be used.
- (v) Information from previous medical examinations of the affected employee that is not otherwise available to the examining physician.

(5) Physician's Written Opinion

- (a) WESTON obtains a written signed opinion from the examining physician. This written opinion contains the results of the medical examination and will include:
 - (i) The physician's opinion as to whether the employee has any detected medical conditions that would place the employee at an increased risk of material health impairment from exposure to asbestos;
 - (ii) Any recommended limitations on the employee or upon the use of personal protective equipment such as clothing or respirators; and
 - (iii) A statement that the employee has been informed by the physician of the results of the medical examination and of any medical conditions resulting from asbestos exposure that require further explanation or treatment.
 - (iv) A statement that the employee has been informed by the physician of the increased risk of lung cancer attributable to the combined effect of smoking and asbestos exposure.
- (6) WESTON has informed the medical consultant/physician to not reveal specific findings or diagnoses unrelated to occupational exposure to asbestos in the written opinion given to WESTON.
- (7) WESTON provides a copy of the physician's written opinion to the affected employee within 30 days from its receipt.

Medical Records and Employee Right to Access to Medical Records

Medical records are retained in strict confidence by WESTON's Medical Consultant in accordance with 29 CFR 1910.20.

Employees are informed upon enrollment in WESTON's Medical Monitoring Program and formally reminded annually of their right to access to and to obtain copies of their medical records. They are instructed in how to obtain access and copies. Copies of medical records are provided at no charges to employees.

Recordkeeping (Objective Data Relied on Pursuant to 29 CFR 1926.1101[f])

Where WESTON has relied on objective data that demonstrates that products made from or containing asbestos, or the activity involving such products or material are not capable of releasing fibers of asbestos in concentrations at or above the PEL and/or excursion limit under the expected conditions of processing, use, or handling to satisfy the requirements of 29 CFR 1926.1101(f), WESTON will establish and maintain an accurate record of objective data reasonably relied upon in support of the exemption.

The record will include at least the following information:

- (1) The product qualifying for exemption.
- (2) The source of the objective data.
- (3) The testing protocol, results of testing, and/or analysis of the material for the release of asbestos.

- (4) A description of the operation exempted and how the data support the exemption.
- (5) Other data relevant to the operations, materials, processing, or employee exposures covered by the exemption.

WESTON will retain this record for the duration of the WESTON's reliance upon such objective data.

Exposure Measurement Records

WESTON keeps an accurate record of all measurements taken to monitor employee exposure to asbestos as prescribed in 29 CFR 1926.1101(f).

NOTE: WESTON may use the services of competent organizations such as industry trade associations and employee associations to maintain the records.

This record includes at least the following information:

- (1) The date of measurement;
- (2) The operation involving exposure to asbestos that is being monitored;
- (3) Sampling and analytical methods used and evidence of their accuracy;
- (4) Number, duration, and results of samples taken;
- (5) Type of protective devices worn, if any; and
- (6) Name, social security number, and exposure of the employees whose exposures are represented.

WESTON will maintain this record for at least thirty (30) years, in accordance with 29 CFR 1910.20.

Medical Surveillance Records

WESTON has established and maintains an accurate record for each employee subject to medical surveillance by 29 CFR 1926.1101(m), in accordance with 29 CFR 1910.20.

The record includes at least the following information:

- (1) The name and social security number of the employee;
- (2) A copy of the employee's medical examination results, including the medical history, questionnaire responses, results of any tests, and physician's recommendations.
- (3) Physician's written opinions;
- (4) Any employee medical complaints related to exposure to asbestos; and
- (5) A copy of the information provided to the physician as required by 29 CFR 1926.1101(m).

WESTON will ensure that this record is maintained for the duration of employment plus thirty (30) years, in accordance with 29 CFR 1910.20.

Training Records

WESTON will maintain all employee training records for one (1) year beyond the last date of employment by that employer.

Data to Rebut PACM

Where WESTON has relied on data to demonstrate that PACM is not asbestos-containing, such data will be maintained for as long as they are relied upon to rebut the presumption.

Records of Required Notifications

Where the building owner has communicated and received information concerning the identification, location and quantity of ACM and PACM, WESTON will maintain written records of such notifications and their content for the duration of ownership and will be transferred to successive owners of such buildings/facilities.

Availability of Records

WESTON, upon written request, will make all records required to be maintained by this section available to the Assistant Secretary and the Director for examination and copying.

WESTON, upon request, will make any exposure records required by 29 CFR 1926.1101(f) and (n) available for examination and copying to affected employees, former employees, designated representatives, and the Assistant Secretary, in accordance with 29 CFR 1910.20(a) through (e) and (g) through (i).

WESTON, upon request, will make employee medical records required by 29 CFR 1926.1101(m) and (n) available for examination and copying to the subject employee, anyone having the specific written consent of the subject employee, and the Assistant Secretary, in accordance with 29 CFR 1910.20.

Transfer of Records

WESTON will comply with the requirements concerning transfer of records set forth in 29 CFR 1910.20(h).

Should WESTON cease to do business and there is no successor employer to receive and retain the records for the prescribed period; WESTON will notify the Director at least 90 days prior to disposal and, upon request, transmit the records to the Director.

Competent Person

Designation of Competent Person

All WESTON asbestos projects will designate a competent person, who is qualified and has the authority to ensure worker safety and health.

In addition to definition in 29 CFR 1926.32 (f), the competent person will be capable of identifying existing asbestos hazards in the workplace; selecting the appropriate control strategy for asbestos exposure, and has the authority to take prompt corrective measures to eliminate hazards, as specified in 29 CFR 1926.32(f).

For Class I and Class II work, the competent person will be specially trained in a course that meets the criteria of EPA's Model Accreditation Plan (40 CFR Part 763) for project designer or supervisor, or its equivalent. For Class III and Class IV work, the competent person will be trained in an operations and maintenance (O&M) course developed by EPA [40 CFR 763.92(a)(2)].

Specific Responsibilities of the Competent Person

As required by 29 CFR 1926.20(b)(2) and good practice, health and safety accident prevention programs will provide for frequent and regular inspections of the job sites, materials, and equipment to be made by the competent persons.

The competent person will make frequent and regular inspections of the job sites, in order to perform the duties set out in 29 CFR 1926.1101(p)(3)(i) and (ii).

- For Class I jobs, site inspections will be made at least once during each work shift, and at any time an employee requests an inspection.
- For Class II and III jobs, site inspections will be made at intervals sufficient to assess whether conditions have changed, and at any reasonable time an employee requests an inspection.

On all worksites where employees are engaged in Class I or II asbestos work, the competent person designated will perform or supervise the following duties, as applicable:

- (1) Set up the regulated area, enclosure, or other containment;
- (2) Ensure (by site inspection) the integrity of the enclosure or containment;
- (3) Set up procedures to control entry to and exit from the enclosure and/or area;
- (4) Supervise all employee exposure monitoring required by this section and ensure that it is conducted as required by 29 CFR 1926.1101(f);
- (5) Ensure that employees working within the enclosure and/or using glove bags wear protective clothing and respirators as required by 29 CFR 1926.1101(h) and (i);
- (6) Ensure through on-site supervision, that employees set up and remove engineering controls, use work practices and personal protective equipment in compliance with all requirements;
- (7) Ensure that employees use the hygiene facilities and observe the decontamination procedures specified in 29 CFR 1926.1101(j);
- (8) Ensure that through on site inspection engineering controls are functioning properly and employees are using proper work practices; and,
- (9) Ensure that notification requirement of 29 CFR 1926.1101(k) are met.

Training for the Competent Person

For Class I, and II asbestos work the competent person will be trained in all aspects of asbestos removal and handling, including: abatement, installation, removal and handling; the contents of 29 CFR 1926.1101; the identification of asbestos; removal procedures, where appropriate; and other practices for reducing the hazard. Such training will be obtained in a comprehensive course for supervisors, such as a course conducted by an EPA or state approved training provider, certified by the EPA or a State, or a course equivalent in stringency, content, and length.

For Class III and IV asbestos work, the competent person will be trained in aspects of asbestos handling appropriate for the nature of the work. This will include procedures for setting up glove bags and mini enclosures, practices for reducing asbestos exposures, use of wet methods, the contents of 29 CFR

1926.1101, and the identification of asbestos. Such training will include successful completion of a course equivalent in curriculum and training method to the 16-hour Operations and Maintenance course developed by EPA for maintenance and custodial workers [See 40 CFR 763.92(a)(2)], or its equivalent in stringency, content, and length. Competent persons for Class III and IV work, may also be trained pursuant to the requirements of 29 CFR 1926.1101(o)(4)(i).

APPENDIX A AIR SAMPLING

1. Method

- a. NIOSH method 7400 will be used to analyze for asbestos with qualification provided by Method 7402 with TEM analysis, if necessary.
- b. In Method 7400, air is drawn through a Mixed Cellulose Ester Filter (SKC Part number 225-312A or equivalent) at a rate of 2.0 liters per minute for shift duration sampling and 2.5 liters per minute for 30-minute sampling. Shift duration sampling periods will be a minimum of 7.5 hours. After four hours of sampling, filters will be examined and if notable loading is seen, a new filter will be used to complete the sampling. This will result in splitting the sampling period. The results of the two filters will be combined to calculate the TWA.
- c. The preferred collection device will be a 25 mm diameter cassette with an open-faced 50 mm electrically conductive extension cowl (SKC Part number 225321 or equivalent). The 37 mm cassette may be used if necessary, but only if written justification accompanies the sample results in the employee's exposure monitoring record. Cassettes for asbestos sample collection are not reused or reloaded.
- d. Personnel air sampling pumps capable of sustaining the 2.0 l/m flow rate required for eight hours will be used to collect the samples.
- e. Air sampling pumps and a representative filter train will be calibrated prior to and following sampling. A Bios Dry Cal calibrator or equivalent will be used. A minimum of three trials with flow rates within 10% of each other will be required for a valid calibration.
- f. Where possible, a sufficient air volume for each air sample will be collected to yield between 100 and 1,300 fibers per square millimeter on the membrane filter. If a filter darkens in appearance or if loose dust is seen on the filter, a second sample will be started.
- g. Samples are shipped in a rigid container with sufficient packing material to prevent dislodging the collected fibers. Packing material that has a high electrostatic charge on its surface (e.g., expanded polystyrene) is not used as such material can cause loss of fibers to the sides of the cassette.
- h. Personal samples are taken in the "breathing zone" of the employee (i.e., attached to or near the collar or lapel near the worker's face).

2. Initial Air Sampling

- a. WESTON will ensure, for all Class I and II operations, daily monitoring representative of the exposure of each employee who is assigned to work within a regulated area will be conducted unless a negative exposure assessment for the entire operation has been made.
- b. WESTON will ensure that periodic monitoring of all work where exposures are expected to exceed a PEL, is conducted at intervals sufficient to document the validity of the exposure prediction for all operations other than Class I and II operations.
- c. Exception: When all employees required to be monitored daily are equipped with supplied-air respirators operated in the positive-pressure mode, WESTON may dispense with the daily monitoring required by this paragraph. However, employees performing Class I work using a control method which is not listed in 29 CFR 1926.1101(g)(4) (i), (ii), or (iii) or using a modification of a listed control method, will continue to be monitored daily even if they are equipped with supplied-air respirators.

3. Termination of Monitoring

- a. If the periodic monitoring required by 29 CFR 1926.1101(f)(3) reveals that employee exposures, as indicated by statistically reliable measurement, are below the permissible exposure limit (PEL) and excursion limit WESTON may discontinue monitoring for those employees whose exposures are represented by such monitoring.
- b. Additional monitoring will be provided whenever there has been a change in: process, control equipment, personnel or work practices that may result in new or additional exposures above the PEL and/or excursion limit. Additional monitoring will also be provided when WESTON has any reason to suspect that a change may result in new or additional exposures above the PEL and/or excursion limit. Such additional monitoring is required regardless of whether a "negative exposure assessment" was previously produced for a specific job.

4. Analysis

WESTON will use site personnel trained in NIOSH METHOD 7400 analysis, internal laboratories or will contract with laboratories that are AIHA Accredited for Asbestos Analysis. The competent person on each WESTON asbestos project is responsible for confirming the use of analytical protocols and quality control procedures, such as those provided in Appendix C.

APPENDIX B CONTENT OF ASBESTOS MEDICAL EXAMINATIONS

The Initial, Periodic, and Exit Protocols for medical examinations of WESTON employees conducting asbestos work (as developed by WESTON's medical contractor) follow:

CLEARANCES-BASELINE	History Questionnaire ^a	Physical Exam	Blood Chemistry	Spirometry	Chest X-ray	Audiogram	EKG
Asbestos/Respirator	X	X	X	X	FX#	X	X
CalOSHA/Asb/Haz/Resp	X	X	X	X	CX#	X	X
Asbestos/Haz/Respirator	X	X	X	X	FX#	X	X
ANNUAL	History Questionnaire	Physical Exam	Blood Chemistry	Spiro	Chest X-ray	Audiogram	EKG
Asbestos/Respirator	X	X	X	X	F#	X	@
CalOSHA/Asb/Haz/Resp	X	X	X	X	C#	X	@
Asbestos/Haz/Respirator	X	X	X	X	F#	X	@
Respirator Only	X	X		X		X	
EXIT	History Questionnaire	Physical Exam	Blood Chemistry	Spiro	Chest X-ray	Audiogram	EKG
Asbestos/Respirator	X	X	X	X	X#	X	
CalOSHA/Asb/Haz/Resp	X	X	X	X	CX#	X	
Asbestos/Haz/Respirator	X	X	X	X	FX#	X	

a = Questionnaires required by 29 CFR 1926.1101 Appendix D

@ = Performed for those 40 and older or if medically indicated

X = Components included in protocol.

X-ray with ILO interpretation

F = 1-view chest X-ray will be performed on all asbestos baseline and exit exams

Frequency of chest X-ray with annual exams will be based on age & years since first asbestos exposure

C = 2-view chest X-ray will be performed on all asbestos baseline and exit exams

Frequency of chest X-ray with annual exams will be based on age & years since asbestos first exposure

APPENDIX C ANALYTICAL REQUIREMENTS

1. Fiber counts are made by positive phase contrast using a microscope with an 8 to 10 X eyepiece and a 40 to 45 X objective for a total magnification of approximately 400 X and a numerical aperture of 0.65 to 0.75. The microscope is also fitted with a green or blue filter.
2. Microscopes are fitted with a Walton-Beckett eyepiece graticule calibrated for a field diameter of 100 micrometers (+/-2 micrometers).
3. The phase-shift detection limit of the microscope is maintained at about 3 degrees measured using the HSE phase shift test slide as outlined below.

- a. Place the test slide on the microscope stage and center it under the phase objective.
- b. Bring the blocks of grooved lines into focus.

Note: The slide consists of seven sets of grooved lines (approximately 20 grooves to each block) in descending order of visibility from sets 1 to 7, with 7 being the least visible. The requirements for asbestos counting are that the microscope optics must resolve the grooved lines in set 3 completely, although they may appear somewhat faint, and that the grooved lines in sets 6 and 7 must be invisible. Sets 4 and 5 must be at least partially visible but may vary slightly in visibility between microscopes. A microscope that fails to meet these requirements has either too low or too high a resolution to be used for asbestos counting.

- c. If the image deteriorates, clean and adjust the microscope optics. If the problem persists, consult the microscope manufacturer.
4. Each set of samples taken include 10% field blanks or a minimum of 2 field blanks. These blanks come from the same lot as the filters used for sample collection. The field blank results will be averaged and subtracted from the analytical results before reporting. A set consists of any sample or group of samples for which an evaluation for this standard must be made.

Any samples represented by a field blank having a fiber count in excess of the detection limit of the method being used will be rejected.

5. The samples are mounted by the acetone/triacetin method or a method with an equivalent index of refraction and similar clarity.
6. The following counting rules are observed.
 - a. Count only fibers equal to or longer than 5 micrometers. Measure the length of curved fibers along the curve.
 - b. In the absence of other information, count all particles as asbestos that have a length-to-width ratio (aspect ratio) of 3:1 or greater.
 - c. Fibers lying entirely within the boundary of the Walton-Beckett graticule field will receive a count of 1. Fibers crossing the boundary once, having one end within the circle, will receive the count of one half (1/2). Any fiber that crosses the graticule boundary more than once is not counted, even though visible fibers are not counted if they are outside the graticule area.
 - d. Bundles of fibers are counted as one fiber unless individual fibers can be identified by observing both ends of an individual fiber.
 - e. Enough graticule fields are counted to yield 100 fibers. Count a minimum of 20 fields; stop counting at 100 fields regardless of fiber count.
7. Blind recounts will be conducted at the rate of 10 percent.

Quality Control Procedures

Criteria for selecting Asbestos analytical Laboratory or Performing On-site Analysis

1. Intra-laboratory program. Each laboratory and/or each company with more than one microscopist counting slides will establish a statistically designed quality assurance program involving blind recounts and comparisons between microscopists to monitor the variability of counting by each microscopist and between microscopists. In a company with more than one laboratory, the program will include all laboratories, and will also evaluate the laboratory to laboratory variability.
2. Inter-laboratory program. Each laboratory analyzing asbestos samples for compliance determination will implement an inter-laboratory quality assurance program that, as a minimum, includes participation of at least two other independent laboratories. Each laboratory will participate in round robin testing at least once every 6 months with at least all the other laboratories in its inter-laboratory quality assurance group. Each laboratory will submit slides typical of its own workload for use in this program. The round robin will be designed and results analyzed using appropriate statistical methodology.
3. All laboratories should also participate in a national sample testing scheme such as the Proficiency Analytical Testing Program (PAT), or the Asbestos Registry sponsored by the American Industrial Hygiene Association (AIHA).
4. All individuals performing asbestos analysis must have taken the NIOSH course for sampling and evaluating airborne asbestos dust or an equivalent course.
5. When the use of different microscopes contributes to differences between counters and laboratories, the effect of the different microscope will be evaluated and the microscope will be replaced, as necessary.
6. Current results of these quality assurance programs will be posted in each laboratory to keep the microscopists informed.

APPENDIX D ASBESTOS INFORMATION

Substance Technical Information for Asbestos - Non-Mandatory (Appendix G to 29 CFR 1910.1001)

1. Substance Identification

- a. Substance: "Asbestos" is the name of a class of magnesium silicate minerals that occur in fibrous form. Minerals that are included in this group are chrysotile, crocidolite, amosite, tremolite asbestos, anthophyllite asbestos, and actinolite asbestos.
- b. Asbestos are used in the manufacture of heat resistant clothing, automotive brake and clutch linings, and a variety of building materials including floor tiles, roofing felts, ceiling tiles, asbestos cement pipe and sheet, and fire resistant drywall. Asbestos is also present in pipe and boiler insulation materials, and in sprayed on materials located on beams, in crawlspaces, and between walls.
- c. The potential for a product containing asbestos to release breathable fibers depends on its degree of friability. Friable means that the material can be crumbled with hand pressure and is therefore likely to emit fibers. The fibrous or fluffy sprayed on materials used for fireproofing, insulation, or sound proofing are considered to be friable, and they readily release airborne fibers if disturbed. Materials such as vinyl asbestos floor tile or roofing felts are considered non-friable and generally do not emit airborne fibers unless subjected to sanding or sawing operations. Asbestos cement pipe or sheet can emit airborne fibers if the materials are cut or sawed, or if they are broken during demolition operations.
- d. Permissible exposure: Exposure to airborne asbestos fibers may not exceed 0.1 fibers per cubic centimeter of air (0.1 f/cc) averaged over the 8 hour workday.

2. Health Hazard Data

- a. Asbestos can cause disabling respiratory disease and various types of cancers if the fibers are inhaled. Inhaling or ingesting fibers from contaminated clothing or skin can also result in these diseases. The symptoms of these diseases generally do not appear for 20 or more years after initial exposure.
- b. Exposure to asbestos has been shown to cause lung cancer, mesothelioma, and cancer of the stomach and colon. Mesothelioma is a rare cancer of the thin membrane lining of the chest and abdomen. Symptoms of mesothelioma include shortness of breath, pain in the walls of the chest, and/or abdominal pain.

3. Respirators and Protective Clothing

- a. Respirators: You are required to wear a respirator when performing tasks that result in asbestos exposure that exceeds the permissible exposure limit (PEL) of 0.1 f/cc. These conditions can occur while your employer is in the process of installing engineering controls to reduce asbestos exposure, or where engineering controls are not feasible to reduce asbestos exposure. Air-purifying respirators equipped with a high-efficiency particulate air (HEPA) filter can be used where airborne asbestos fiber concentrations do not exceed 1.0 f/cc; otherwise, air-supplied, positive-pressure, full face piece respirators must be used.

Disposable respirators or dust masks are not permitted to be used for asbestos work. For effective protection, respirators must fit your face and head snugly. Your employer is required to conduct fit tests when you are first assigned a respirator and every 6 months thereafter. Respirators should not be loosened or removed in work situations where their use is required.

- b. Protective Clothing: You are required to wear protective clothing in work areas where asbestos fiber concentrations exceed the PEL of 0.1 f/cc to prevent contamination of the skin. Where protective clothing is required, your employer must provide you with clean garments. Unless you are working on a large asbestos removal or demolition project, your employer must also provide a change room and separate lockers for your street clothes and contaminated work clothes.
 - c. If you are working on a large asbestos removal or demolition project, and where it is feasible to do so, your employer must provide a clean room, shower, and decontamination room contiguous to the work area. When leaving the work area, you must remove contaminated clothing before proceeding to the shower. If the shower is not adjacent to the work area, you must vacuum your clothing before proceeding to the change room and shower. To prevent inhaling fibers in contaminated change rooms and showers, leave your respirator on until you leave the shower and enter the clean change room.
4. Disposal Procedures and Cleanup
- a. Wastes that are generated by processes where asbestos are present include:
 - (1) Empty asbestos shipping containers.
 - (2) Process wastes such as cuttings, trimmings, or reject material.
 - (3) Housekeeping waste from sweeping or vacuuming.
 - (4) Asbestos fireproofing or insulating material that is removed from buildings.
 - (5) Building products that contain asbestos removed during building renovation or demolition.
 - (6) Contaminated disposable protective clothing.
 - b. Empty shipping bags can be flattened under exhaust hoods and packed into airtight containers for disposal. Empty shipping drums are difficult to clean and should be sealed.
 - c. Vacuum bags or disposable paper filters should not be cleaned, but should be sprayed with a fine water mist and placed into a labeled waste container.
 - d. Process waste and housekeeping waste should be wetted with water or a mixture of water and surfactant prior to packaging in disposable containers.
 - e. Material containing asbestos that is removed from buildings must be disposed of in leak tight 6 mil thick plastic bags, plastic lined cardboard containers, or plastic lined metal containers. These wastes, which are removed while wet, should be sealed in containers before they dry out to minimize the release of asbestos fibers during handling.
5. Access to Information
- a. Each year, your employer is required to inform you of the information contained in this standard and appendices for asbestos. In addition, your employer must instruct you in the proper work practices for handling materials containing asbestos, and the correct use of protective equipment.
 - b. Your employer is required to determine whether you are being exposed to asbestos. You or your representative has the right to observe employee measurements and to record the results obtained. Your employer is required to inform you of your exposure, and, if you are exposed above the permissible limit, he or she is required to inform you of the actions that are being taken to reduce your exposure to within the permissible limit.
 - c. Your employer is required to keep records of your exposures and medical examinations. These exposure records must be kept for at least thirty (30) years. Medical records must be kept for the period of your employment plus thirty (30) years.
 - d. Your employer is required to release your exposure and medical records to your physician or designated representative upon your written request.

Definitions

Aggressive method means removal or disturbance of building material by sanding, abrading, grinding or other method that breaks, crumbles, or disintegrates intact asbestos containing material (ACM).

Amended water means water to which surfactant (wetting agent) has been added to increase the ability of the liquid to penetrate ACM.

Asbestos means chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos and any of these minerals that have been chemically treated and/or altered.

Asbestos containing material (ACM) means any material containing more than 1% asbestos.

Assistant Secretary means the Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, or designee.

Authorized person means any person authorized by the employer and required by work duties to be present in regulated areas.

Class I asbestos work means activities involving the removal of thermal system insulation (TSI) and surfacing ACM and presumed asbestos containing material (PACM).

Class II asbestos work means activities involving the removal of ACM which is not TSI or surfacing material. This includes, but is not limited to, the removal of asbestos containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastics.

Class III asbestos work means repair and maintenance operations, where ACM, including thermal system insulation and surfacing material, is likely to be disturbed.

Class IV asbestos work means maintenance and custodial activities in which employees contact ACM and PACM. Activities to clean up waste and debris containing ACM and PACM.

Building/facility owner is the legal entity, including a lessee, which exercises control over management and record keeping functions relating to a building and/or facility in which activities covered by this standard take place.

Certified Industrial Hygienist (CIH) means one certified in the practice of industrial hygiene by the American Board of Industrial Hygiene.

Clean room means an uncontaminated room having facilities for the storage of employees' street clothing and uncontaminated materials and equipment.

Closely resemble means that the major workplace conditions which have contributed to the levels of historic asbestos exposure are no more protective than conditions of the current workplace.

Competent person means in addition to the definition in 29 CFR 1926.32 (f), one who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, who has the authority to take prompt corrective measures to eliminate them, as specified in 29 CFR 1926.32(f). In addition, for Class I and Class II work one who is specially trained in a training course which meets the criteria of EPA's Model Accreditation Plan (40 CFR 763) for supervisor, or its equivalent and, for Class III and Class IV work, who is trained in a manner consistent with EPA

requirements for training of local education agency maintenance and custodial staff as set forth at 40 CFR 763.92 (a)(2).

Critical barrier means one or more layers of plastic sealed over all openings into a work area or any other similarly placed physical barrier sufficient to prevent airborne asbestos in a work area from migrating to an adjacent area.

Decontamination area means enclosed areas adjacent and connected to regulated areas (consist of an equipment room, shower area, and clean room), used for decontamination of workers, materials, and equipment that are contaminated with asbestos.

Demolition means the wrecking or taking out of any load supporting structural member and any related razing, removing, or stripping of asbestos products.

Director means the Director, National Institute for Occupational Safety and Health (NIOSH), U.S. Department of Health and Human Services, or designee.

Disturbance means contact which releases fibers from ACM or PACM or debris containing ACM or PACM. This term includes activities that disrupt the matrix of ACM or PACM, render ACM or PACM friable, or generate visible debris.

- Disturbance includes cutting away small amounts of ACM and PACM, no greater than the amount which can be contained in one standard sized glove bag or waste bag in order to access a building component.

In no event will the amount of ACM or PACM so disturbed exceed that which can be contained in one glove bag or waste bag which will not exceed 60 inches in length and width.

Employee exposure means that exposure to airborne asbestos that would occur if the employee was not using respiratory protective equipment.

Equipment room (change room) means a contaminated room located within the decontamination area that is supplied with impermeable bags or containers for the disposal of contaminated protective clothing and equipment.

Fiber means a particulate form of asbestos, 5 micrometers or longer, with a length-to-diameter ratio of at least 3 to 1.

Filtering facepiece (dust mask) means a negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium.

Glove-bag means not more than a 60 x 60 inch impervious plastic bag-like enclosure affixed around an asbestos-containing material, with glove-like appendages through which material and tools may be handled.

High-efficiency particulate air (HEPA) filter means a filter capable of trapping and retaining at least 99.97% of all mono-dispersed particles of 0.3 micrometers in diameter.

Homogeneous area means an area of surfacing material or thermal system insulation that is uniform in color and texture.

Industrial hygienist means a professional qualified by education, training, and experience to anticipate, recognize, evaluate, and develop controls for occupational health hazards.

Intact means that the ACM has not crumbled, been pulverized, or otherwise deteriorated so that it is no longer likely to be bound with its matrix.

Modification means a changed or altered procedure, material or component of a control system, which replaces a procedure, material or component of a required system. Omitting a procedure or component, or reducing or diminishing the stringency or strength of a material or component of the control system is not a "modification" for purposes of 29 CFR 1926.1101(g)(6)(ii).

Negative Initial Exposure Assessment means a demonstration by the employer, which complies with the criteria in 29 CFR 1926.1101(f)(2)(iii), that employee exposure during an operation is expected to be consistently below the PELs.

Presumed Asbestos Containing Material (PACM) means thermal system insulation and surfacing material found in buildings constructed no later than 1980. The designation of a material as "PACM" may be rebutted pursuant to 29 CFR 1926.1101(k)(5).

Project Designer means a person who has successfully completed the training requirements for an abatement project designer established by 40 U.S.C. 763.90(g).

Regulated area means an area established by the employer to demarcate areas where airborne concentrations of asbestos exceed, or there is a reasonable possibility they may exceed, the permissible exposure limits; also an area established by the employer to demarcate areas where Class I, II, and III asbestos work is conducted, and any adjoining area where debris and waste from such asbestos work accumulate; and a work area within which airborne concentrations of asbestos, exceed or there is a reasonable possibility they may exceed the permissible exposure limit. Requirements for regulated areas are set out in 29 CFR 1926.1101(e)(6).

Removal means all operations where ACM and/or PACM are taken out or stripped from structures or substrates, and includes demolition operations.

Renovation means the modifying of any existing structure, or portion thereof.

Repair means overhauling, rebuilding, reconstructing, or reconditioning of structures or substrates, including encapsulation or other repair of ACM or PACM attached to structures or substrates.

Surfacing material means material that is sprayed, troweled on or otherwise applied to surfaces (such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, and other purposes).

Surfacing ACM means surfacing material which contains more than 1% asbestos.

Thermal system insulation (TSI) means ACM applied to pipes, fittings, boilers, breeching, tanks, ducts, or other structural components to prevent heat loss or gain.

Thermal system insulation ACM is TSI which contains more than 1% asbestos.

WESTON means WESTON Solutions Inc or subcontractors to WESTON or subcontractors for whom WESTON is responsible.

FLD 57 – MOTOR VEHICLE SAFETY

RELATED OP AND FLD

OP 11-01-017 – Motor Vehicle Safety

FLD 11 – Rough Terrain

This FLD applies to vehicles other than passenger vehicles that are operated when performing WESTON activities/operations. WESTON personnel safe driving requirements must be included in site-specific health and safety plans and accident prevention plans.

SAFE VEHICLE OPERATION

The vehicle operator is responsible for the vehicle, and for ensuring that the vehicle is in good working condition before use. WESTON employees must not operate a vehicle with any mechanical defect which endangers the safety of the driver, passengers, or the public. Before use, the vehicle operator must ensure that the vehicle is safe to operate and free from apparent damage that could result in failure while in use. The vehicle operator documents the inspection of the Equipment/Trucking Inspection Checklist available on the Weston EHS Portal.

Vehicle operators are responsible for observing the procedure established in *OP 11-01-017 Motor Vehicle Safety* and the following requirements:

- comply with all state and local traffic laws
- drive defensively
- comply with client requirements regarding motor vehicle operation
- use seat belts at all times when the vehicle is in motion
- ensure that all passengers are using seat belts at all times when the vehicle is in motion
- use caution when driving through congested areas, or near where personnel and equipment are working
- use a spotter for backing vehicles, if possible.

Vehicle operators must observe the following prohibited actions:

- DO NOT operate a motor vehicle under the influence of alcohol or drugs.
- DO NOT leave keys in an unattended vehicle.
- DO NOT leave the driver's seat of a vehicle while the motor is running.
- DO NOT operate a motor vehicle when abnormally tired.
- DO NOT drive beyond any barricades or into any area posted with designations, such as "NO TRESPASSING," "RESTRICTED AREA," or "DO NOT ENTER."
- DO NOT allow riders on the outside of a vehicle while it is in motion.

SAFETY DURING TRAVEL

- Know the traveling height (overhead clearance), width, length, and weight of the vehicle and know highway and bridge load, width and overhead limits, making sure these limits are not exceeded with an adequate margin.
- Never move a vehicle unless the vehicle brakes are in sound working order.
- Allow for any overhang when cornering or approaching other vehicles or structures.
- Be aware that the canopies of service stations and motels may be too low for a high-profile vehicle.
- Watch for low hanging electrical lines, particularly at the entrances to work sites, restaurants, motels, or other commercial sites.
- Remove all ignition keys when a drill rig is left unattended.
- For off-road travel, refer to FLD 11.

LOADING AND UNLOADING

The following guidelines should be followed, as applicable, when loading and unloading vehicles.

Tractors and/or trailers must be chocked during loading and unloading. Deck plates and positive anchor systems must be used for delivery to elevated platforms at trailer floor level if unloaded by fork lifts. Trailers detached from tractors must have additional support if fork lifts will enter or if instability of load presents a hazard of front wheels collapsing.

When loading or unloading a vehicle (such as a drill rig) or other "large" equipment on a trailer or a truck:

- Use ramps of adequate design that are solid and substantial enough to bear the weight of the vehicle or equipment with carrier - including tooling.
- Load and unload on level ground.
- Use the assistance of someone on the ground as a guide.
- Check the brakes on the vehicle or carrier before approaching loading ramps.
- Distribute the weight of the vehicle or carrier, and tools on the trailer so that the center of weight is approximately on the centerline of the trailer and so that some of the trailer load is transferred to the hitch of the pulling vehicle. Refer to the trailer manufacturer's weight distribution recommendations.

Secure the vehicle/equipment and tools to the hauling vehicle with ties, chains, and/or load binders of adequate capacity.

INSPECTION AND PRECAUTIONS

Tires

Vehicle tires must be checked daily for safety and during extended travel for loss of air, and maintained and/or repaired in a safe manner. If tires are deflated to reduce ground pressure for movement on soft ground, the tires must be reinflated to normal pressures before movement on firm or hilly ground or on streets, roads, and highways. Under-inflated tires are not as stable on firm ground as properly inflated

tires. Air pressures should be maintained for travel on streets, roads, and highways according to the manufacturer's recommendations. During tire checks, inspect for:

- Missing or loose wheel lugs.
- Objects wedged between duals or embedded in the tire casing.
- Damage to or poorly fitting rims or rim flanges.
- Abnormal or uneven wear and cuts, breaks, or tears in the casing.

The repair of truck and off-highway tires should only be made with required special tools and following the recommendations of a tire manufacturer's repair manual.

Batteries

Batteries contain strong acid. Use extreme caution when inspecting or charging batteries.

- Service batteries in a ventilated area while wearing safety glasses.
- When charging a battery with a battery charger, turn off the power source to the battery before either connecting or disconnecting charger leads to the battery posts. Cell caps should be loosened prior to charging to permit the escape of gas.
- Spilled battery acid can burn your skin and damage your eyes. Immediately flush spilled battery acid off of your skin with lots of water. Should battery acid get into someone's eyes, flush immediately with large amounts of water and see a medical physician at once.
- To avoid battery explosions, keep the cells filled with electrolyte, use a flashlight (not an open flame) to check electrolyte levels, and avoid creating sparks around the battery by shorting across a battery terminal. Keep lighted smoking materials and flames away from batteries.
- When a battery is removed from a vehicle or service unit, disconnect the battery ground clamp first.
- Secure batteries when transporting to prevent tip over.
- When installing a battery, connect the battery ground clamp last.

Fuel

Special precautions must be taken for handling fuel and refueling vehicles. Vehicles should not be fueled from open cans or by other makeshift methods, as there is great danger of flash fire from hot engines.

- Engines should be shut off while fueling.
- Only use the type and quality of fuel recommended by the engine manufacturer.
- Refuel in a well-ventilated area.
- Do not fill fuel tanks while the engine is running. Turn off all electrical switches.
- Do not spill fuel on hot surfaces. Clean any spillage before starting an engine.
- Wipe up spilled fuel with cotton rags or cloths - do not use wool or metallic cloth.
- Keep open lights, lighted smoking materials, and flames or sparking equipment well away from the fueling area.
- Turn off heaters in carrier cabs when refueling the carrier.

- Do not fill portable fuel containers completely full to allow expansion of the fuel during temperature changes.
- Keep the fuel nozzle in contact with the tank being filled to prevent static sparks from igniting the fuel.
- Do not transport portable fuel containers in the vehicle or carrier cab with personnel.
- Keep fuel containers and hoses in contact with a metal surface during travel to prevent the buildup of static charge.

FLD 60 EMPLOYEE DUTY SCHEDULE/BASIC FATIGUE MANAGEMENT PLAN

For project assignments lasting longer than two weeks, WESTON employees should not work in excess of 84 hours per week unless approved by the Project Manager. The Division and Corporate EHS communities, as well as the local Operations/Resource Manager are available to support the Project Manager's decision process. Certain Federal Contracts, Regulatory Agencies, and Country-specific (non-CONUS) regulations may require more stringent limitations on work hours which will be addressed in Weston's Staffing and Work Plans.

Project Health and Safety Plans (HASPs) will address the potential for and specific employee requirements as they relate to working long hours. On project assignments requiring long work hours, Site Supervisors and/or Field Safety Officers (FSOs) will monitor employees for signs of stress-related health problems and assist employees as appropriate. Employee rotations may need to be adjusted to allow for individual differences in how fatigue-related stress is handled and for their specific role on the Project.

While working extended hours, employee travel time to and from work will be minimized to allow for sufficient rest and should be taken into account in determining hours per day and per week limits. Group transportation to and from the work location and lodging may be used to address this situation. The Project HASP will address project-related commuting and employee fatigue.

There may be extreme circumstances that require employees to work longer rotations based on given Project circumstances. If a Project requires a WESTON employee to work greater than 84 hours per week for more than two weeks, this will be addressed in the HASP and approved by the Project Manager. The HASP will address recognition of fatigue, actions to take when fatigue is noted, and appropriate and relevant elements of a Fatigue Management Plan to ensure risk mitigation. Anyone having concerns about safety issues relating to long hours should discuss these with the Project Manager, FSO, Office Safety Manager, or Division EHS Manager.

Appendix A is a Risk of Injury Table that presents data from studies where risk of injury was quantified and/or modeled. Appendix B is a reprint of an article that describes symptoms of fatigue. Additional information on fatigue, fatigue factors, and mitigation will also be posted on the Corporate EHS Portal Site.

APPENDIX A RISK OF INJURY TABLE

Association Between Working Extended Work Shifts/Work Weeks and Workplace Injury: Summary of Reviewed Literature

This table highlights studies that evaluated the association between hours worked and occupational injury. It presents data from several recent studies where the risk of injury has been quantified and/or modeled. None of the studies highlighted here evaluate how the implementation of a well-designed and well-managed fatigue management program would impact the risk of injury. However, it is clear from the studies that when aspects of such a program (e.g., including breaks throughout a work shift) are implemented, fatigue is reduced and performance is enhanced; the risk of injury may be similarly reduced. These data should be used collectively when designing a work schedule for an incident-specific fatigue management plan. It is “necessary to consider the various features of the schedule in combination with one another, rather than in isolation from one another” (Johnson & Lipscomb, 2006).

Reference	Risk of Injury (as compared with working 8-hr work day, working during the day shift, and working a 40 hr work week)					
	10-hr work shift	12-hour work shift	afternoon work shift	night work shift	successive shifts	> 40-hr work week
S. Vegso, et al, 2007						↑ by 88% for those who worked more than 64 hr during the previous week
Folkhard & Lombardi, 2006 (model using results from numerous studies)	↑ by 13%	↑ by 27.5%	↑ by 15.2%	↑ by 27.9%	Night Shifts: ↑ by 6% for 2 nd night worked ↑ by 17% for 3 rd night worked ↑ by 36% for 4 th night worked Day Shifts: ↑ by 2% for 2 nd day worked ↑ by 7% for 3 rd day worked ↑ by 17% for 4 th day worked	Varies based on length of shift and time of day. For any given work week duration, a long span of short shifts is likely to be safer than a short span of long shifts. 60 hour week – as 6 10-hr days: ↑ by 16% (day) ↑ by 54% (night) as 5 12-hr days: ↑ by 28% (day) ↑ by 62% (night)
Dembe, et al, 2005		↑ by 37%				↑ by 23% (60 hrs/week)

Reference	Risk of Injury (as compared with working 8-hr work day, working during the day shift, and working a 40 hr work week)					
	10-hr work shift	12-hour work shift	afternoon work shift	night work shift	successive shifts	> 40-hr work week
Dong, 2005	↑ by 57% (> 8 hrs; construction workers)					↑ by 98% (> 50 hrs; all occupations)
Folkhard & Lombard, 2004	↑ by 13%	↑ by 27.5%	↑ by 18.3%	↑ by 30.4%	Night Shifts: ↑ by 6% for 2 nd night worked ↑ by 17% for 3 rd night worked ↑ by 36% for 4 th night worked Day Shifts: ↑ by 2% for 2 nd day worked ↑ by 7% for 3 rd day worked ↑ by 17% for 4 th day worked	
Folkhard & Tucker 2003,			↑ by 18.3%	↑ by 30.4%	Night Shifts: ↑ by 6% for 2 nd night worked ↑ by 17% for 3 rd night worked ↑ by 36% for 4 th night worked Day Shifts: ↑ by 2% for 2 nd day worked ↑ by 7% for 3 rd day worked ↑ by 17% for 4 th day worked	
Baker, 2003*	no significant ↑; accidents peaked – 10 th hour (day shift) and 12 th hour (night shift)					

Reference	Risk of Injury (as compared with working 8-hr work day, working during the day shift, and working a 40 hr work week)					
	10-hr work shift	12-hour work shift	afternoon work shift	night work shift	successive shifts	> 40-hr work week
Johnson & Sharit, 2001*		No significant ↑ (switched from 8- to 12-hr work shift)				

* “Research comparing 8- and 12-hour shift schedules has not consistently reported increases in health and safety risks with longer shift durations. Some of the 12-hr shift schedules offset longer shifts with fewer consecutive work days (a “compressed” work week) and more rest days so that total hours approximate a 40-hr week. Fewer commutes may be another offsetting advantage. Thus, future research needs to consider potential interactions of shift length with length of work week, opportunity for rest, and commuting requirements.” (Caruso et al., 2006)

Considerations for evaluating data included in this table:

- This table highlights studies that evaluate the relationship between hours worked and risk of injury. It presents data from several recent studies where this relationship has been quantified or modeled. There are numerous studies that evaluate the relationship between hours worked and other health effects, which are of equal importance in understanding the full range of effects that workers may experience when working extended work shifts, work weeks, and work rotations. Many of these studies are highlighted in the literature review presented in this Appendix.
- None of the studies evaluated recovery workers during disaster operation.
- Most of the studies included individuals working in a broad range of occupations, or focused on a single manufacturing or market sector. The study lead by Dong focused on construction workers, an occupation that is frequently involved in recovery operation, but did not focus on construction operations during disaster recovery.
- All of the studies have design and data limitations – it is important to understand these when evaluating the data presented in the study and in this table.
- The type and severity of injury is not well defined in the studies reviewed. Folkard and Lombardi (2006) note that “in the vast majority of cases the incidents on which these trends are based were not severe, but it is likely that they represent a relatively direct measure of the occurrence of mistakes and omissions.” Injury severity likely varies among the individuals within each study and between the studies evaluated.

APPENDIX B YOU MIGHT BE FATIGUED IF....

by Frederick V. Malmstrom, Ph.D., CPE from *Flying Safety*, February 1997, pg 14-15 (Reprinted by permission.)

The National Transportation Safety Board (NTSB) doesn't consider fatigue a "cause" of aviation mishaps. Rather, as a "contributing factor." Personally, I think this kind of reasoning is more an exercise in semantics than reality. But, whatever the causes, the results of fatigue can be deadly.

So, what on earth is fatigue? It is, as psychologists are fond of saying, a theoretical construct. Nobody can measure it, weight it, time it, smell it, or place any physical units on it—yet everyone agrees it exists. It's been said that for every two Frenchmen who meet in a coffee house, a new political party is formed. It's also said that for every psychologist who writes an article on fatigue, a new definition of fatigue is created.

Fatigue is typified by symptoms of inattention, degraded judgment, poor motor skills, exhaustion, confusion, and a whole long list of other effects. (See table 1.)

I have experienced the near-fatal side effects of fatigue. This was an instance when we'd been up flying combat all night and coasted in sleepily for a dawn landing. The brakes somehow had collected water and froze. During the half-second of fatigue-induced inattention after touchdown, our EB-66C's brakes locked up, and we spun into the infield grass. Happily, all six of us walked (well, ran) away from that one.

THE FOUR CAUSES OF FATIGUE

As researchers Richard Adams of Advanced Aviation Concepts and Dr. Alan Stokes of the Florida Institute of Technology (1995) warn, fatigue is much more than just sleep deprivation. There are at least four known causes:

1. Inadequate rest.
2. Desynchronized physiological circadian rhythms.
3. Weariness following physical activity.
4. Impaired judgment following prolonged mental activity.

And any or all of the above-mentioned causes are enough to induce fatigue.

FATIGUE-INDUCED ERRORS

Even though the NTSB says fatigue doesn't "cause" mishaps, research shows it sure causes errors. As students of the theory of signal detection know, there are only two categories of flying errors: (1) *errors of commission*, and (2) *errors of omission*.

Unfortunately, fatigue causes both categories of error, although the error of *omission* is by far the most common.

Adams and Stokes cited a classic 1948 U.K. study in which fatigued subjects flying a simulator made numerous errors of omission followed by several "catch-up" errors of commission. Talk about making a bad situation badder!

What are the most common fatigue-induced flight errors? Well, for instance, in 1995, Dr. J. C. Wilson of Leicester University and Capt A. Elsey and Mr. P. Hunton of British Airline Pilots' Association (BAPA) surveyed over 1,000 U.K. commercial pilots and flight engineers. Although no single type of fatigue-related error is overwhelming the "miscommunication"* error seems to come up more frequently. Their

study found a shotgun spread of fatigue-related errors—probably because fatigue is a *global* thing. When you fly long hours, you fatigue your entire person—not just your eyes, not just your mind, and not even just your backside. The nasty thing about fatigue is that it seems to lower your all-around ability to *integrate* the parts of the puzzle.

Fatigued individuals have limited attention—they see the trees but not the forest. For instance, older (like me) people are especially vulnerable to fatigue. That’s probably in no small part due to our reduced brain, skeletal, and muscle mass. There is simply physically less of us to cope with the global problems of the world.

HOW DO YOU RECOGNIZE FATIGUE?

Unfortunately, fatigue, like hypoxia, tends to sneak up on the victim gradually and isn’t always easy to recognize. Having worked with mental patients for years, I’ve noted that the truly psychotic persons are themselves the last to know that they’re crazy. Hence, they must rely on outside observers to point this out to them, and even then, these disturbed persons often won’t accept the fact. Likewise, fatigued persons tend to be in denial and wouldn’t always recognize fatigue if it bit them.

Dr. Richard F. Haines and C. Flatau, in their book *Night Flying* (1992), have taken the time to table some observable effects of fatigue. I’ve condensed some of their findings into Table 1. Note that some of the effects can be seen only by you (intrinsic symptoms). Extrinsic symptoms are easily seen only by others. Please take the time to note the extrinsic symptoms. They’re the kind of behaviors which the individual typically ignores but the outsider should be able to spot rather easily.

If you aren’t able to recognize your own fatigue symptoms, the least you can do is recognize these fatigue symptoms in others. And, if you do, you can say, “You might be fatigued if...you have these symptoms.” I’d have been grateful if someone had brought that to my attention on that morning 30 years ago while I was landing in the EB-66C.

*Miscommunication is a hot topic in aviation research. CRM—crew resource management (aka cockpit resource management)—analyzes things like crew workload, social interactions, and (mis)communications. For further reading, see Maj. Eric Offil’s article, “Cockpit Resource Management,” in the September 1996 *Flying Safety*.

**Table 1. You might be fatigued if...you have these observable effects of fatigue
(from Haines & Flatau, 1992)**

WHAT YOU SEE:	
INTRINSIC SYMPTOMS	
A. PHYSICAL	1. Frequent, unexplainable headaches
	2. Muscular aches and pains
	3. Breathing difficulties
	4. Blurred/double vision
	5. Burning urination
B. MENTAL	1. Attentional focusing
	2. Easily distracted
	3. Reduced flying standards
	4. Feeling of depression
	5. Impaired judgment
	6. Poor visual perception

WHAT OTHERS SEE:	
EXTRINSIC SYMPTOMS	
A. PHYSICAL	1. Degraded motor skills
	2. Tenseness and tremors
	3. Intolerant/irritable
	4. Increased reaction time
	5. Social withdrawal
B. MENTAL	1. Absentmindedness
	2. Poor short-term memory
	3. Lack of interest and drive
	4. Confused and fearful
	5. Slow startle response
	6. Worried and anxious

ATTACHMENT D
HAZARD COMMUNICATION PROGRAM

SITE-SPECIFIC HAZARD COMMUNICATION PROGRAM

Location-Specific Hazard Communication Program/Checklist

To ensure an understanding of and compliance with the Hazard Communication Standard, WESTON will use this checklist/document (or similar document) in conjunction with the WESTON Written Hazard Communication Program as a means of meeting site- or location-specific requirements.

While responsibility for activities within this document reference the WESTON Safety Officer (SO), it is the responsibility of all personnel to effect compliance. Responsibilities under various conditions can be found within the WESTON Written Hazard Communication Program.

To ensure that information about the dangers of all hazardous chemicals used by WESTON are known by all affected employees, the following Hazard Communication Program has been established. All affected personnel will participate in the Hazard Communication Program. This written program, as well as WESTON's Corporate Hazard Communication Program, will be available for review by any employee, employee representative, representative of OSHA, NIOSH, or any affected employer/employee on a multi-employer site.

- ☐ Site or other location name/address: M&H Zinc
- ☐ Site/Project/Location Manager: Lisa Graczyk
- ☐ Site/Location Safety Officer: _____
- ☐ List of chemicals compiled, format: ☐ HASP ☐ Other: _____
- ☐ Location of MSDS files: _____
- ☐ Training conducted by: Name: _____ Date: _____
- ☐ Indicate format of training documentation: ☐ Field Log: ☐ Other: _____
- ☐ Client briefing conducted regarding hazard communication: _____
- ☐ If multi-employer site (client, subcontractor, agency, etc.), indicate name of affected companies: _____
- ☐ Other employer(s) notified of chemicals, labeling, and MSDS information: _____
- ☐ Has WESTON been notified of other employer's or client's hazard communication program(s), as necessary? ☐ Yes ☐ No

List of Hazardous Chemicals

A list of known hazardous chemicals used by WESTON personnel must be prepared and attached to this document or placed in a centrally identified location with the MSDSs. Further information on each chemical may be obtained by reviewing the appropriate MSDS. The list will be arranged to enable cross-reference with the MSDS file and the label on the container. The SO or Location Manager is responsible for ensuring the chemical listing remains up-to-date.

Container Labeling

The WESTON SO will verify that all containers received from the chemical manufacturer, importer, or distributor for use on-site are clearly labeled.

The SO is responsible for ensuring that labels are placed where required and for comparing MSDSs and other information with label information to ensure correctness.

Material Safety Data Sheets (MSDSs)

The SO is responsible for establishing and monitoring WESTON's MSDS program for the location. The SO will ensure that procedures are developed to obtain the necessary MSDSs and will review incoming MSDSs for new or significant health and safety information. He/she will see that any new information is passed on to the affected employees. If an MSDS is not received at the time of initial shipment, the SO will call the manufacturer and have an MSDS delivered for that product in accordance with the requirements of WESTON's Written Hazard Communication Program.

A log for, and copies of, MSDSs for all hazardous chemicals in use will be kept in the MSDS folder at a location known to all site workers. MSDSs will be readily available to all employees during each work shift. If an MSDS is not available, immediately contact the WESTON SO or the designated alternate. When a revised MSDS is received, the SO will immediately replace the old MSDS.

Employee Training and Information

The SO is responsible for the WESTON site-specific personnel training program. The SO will ensure that all program elements specified below are supplied to all affected employees.

At the time of initial assignment for employees to the work site, or whenever a new hazard is introduced into the work area, employees will attend a health and safety meeting or briefing that includes the information indicated below.

- Hazardous chemicals present at the work site.
- Physical and health risks of the hazardous chemicals.
- The signs and symptoms of overexposure.
- Procedures to follow if employees are overexposed to hazardous chemicals.
- Location of the MSDS file and Written Hazard Communication Program.
- How to determine the presence or release of hazardous chemicals in the employee's work area.
- How to read labels and review MSDSs to obtain hazard information.
- Steps WESTON has taken to reduce or prevent exposure to hazardous chemicals.
- How to reduce or prevent exposure to hazardous chemicals through the use of controls procedures, work practices, and personal protective equipment.
- Hazardous, nonroutine tasks to be performed (if any).
- Chemicals within unlabeled piping (if any).

Hazardous Nonroutine Tasks

When employees are required to perform hazardous nonroutine tasks, the affected employee(s) will be given information by the SO about the hazardous chemicals he or she may use during such activity. This information will include specific chemical hazards, protective and safety measures the employee can use, and steps WESTON is using to reduce the hazards. These steps include, but are not limited to, ventilation, respirators, presence of another employee, and emergency procedures.

Chemicals in Unlabeled Pipes

Work activities may be performed by employees in areas where chemicals are transferred through unlabeled pipes. Prior to starting work in these areas, the employee will contact the SO, at which time information as to the chemical(s) in the pipes, potential hazards of the chemicals or the process involved, and the safety precautions that should be taken will be determined and presented.

Multi-Employer Work Sites

It is the responsibility of the SO to provide other employers with information about hazardous chemicals imported by WESTON to which their employees may be exposed, along with suggested safety precautions. It is also the responsibility of the SO and the Site Manager to obtain information about hazardous chemicals used by other employers to which WESTON employees may be exposed. WESTON's chemical listing will be made available to other employers, as requested. MSDSs will be available for viewing, as necessary.

The location, format, and/or procedures for accessing MSDS information must be relayed to affected employees.

ATTACHMENT E
AIR SAMPLING DATA SHEETS

SITE AIR MONITORING PROGRAM								
Field Data Sheets								
Location:								
% LEL	% O ₂	PID (units)	FID (units)	Aerosol Monitor (mg/m ³)	GM: Shield Probe/ Thin Window		Nal (uR/hr)	ZnS (cpm)
					mR/hr	cpm		
Monitox (ppm)				Detector Tube(s)				
Sound Levels (dBA)		Illumination	pH	Other	Other	Other	Other	Other
Location:								
% LEL	% O ₂	PID (units)	FID (units)	Aerosol Monitor (mg/m ³)	GM: Shield Probe/ Thin Window		Nal (uR/hr)	ZnS (cpm)
					mR/hr	cpm		
Monitox (ppm)				Detector Tube(s)				
Sound Levels (dBA)		Illumination	pH	Other	Other	Other	Other	Other

AIR MONITORING/SAMPLING DATA LOG					
Client:		W.O. No.:		Sample No.:	
Address:		Sampled By:		Date:	
Employee and Location Information					
Employee Name:		Employee No.:		Job Title:	
Respirator <input type="checkbox"/> APR <input type="checkbox"/> ½ Mask <input type="checkbox"/> Full Face <input type="checkbox"/> PAPR <input type="checkbox"/> ½ Mask <input type="checkbox"/> Full Face <input type="checkbox"/> Hood <input type="checkbox"/> SAR <input type="checkbox"/> ½ Mask <input type="checkbox"/> Full Face <input type="checkbox"/> Hood <input type="checkbox"/> SCBA		Manufacturer: 		Cartridge Type: 	
PPE: <input type="checkbox"/> Hard Hat <input type="checkbox"/> HPD <input type="checkbox"/> Gloves <input type="checkbox"/> Safety Shoes <input type="checkbox"/> Coveralls <input type="checkbox"/> Other:					
Sampling Data					
Sampling Type: <input type="checkbox"/> Personal <input type="checkbox"/> TWA <input type="checkbox"/> STEL <input type="checkbox"/> Area <input type="checkbox"/> Source <input type="checkbox"/> Full Shift <input type="checkbox"/> Partial Shift <input type="checkbox"/> Grab		Media: 		Pump Type/Serial No.: 	
Calibrator/Serial No.: 		Pre-Calibration: 1. 2. 3. avg-pre:		Post-Calibration: 1. 2. 3. avg-post:	
Start Time:		Restart Time:		Avg. Flowrate:	
1 st Stop Time:		2 nd Stop Time:		Total Time:	
3 rd Stop Time:		Volume:		% Change:	
Multiple Samples for this TWA: <input type="checkbox"/> Yes <input type="checkbox"/> No		Multiple Chemical Exposures: <input type="checkbox"/> Yes <input type="checkbox"/> No		Exposure Time: <input type="checkbox"/> Normal <input type="checkbox"/> Worst Case	
Sampling Conditions					
Weather Conditions: Temp: R.H: B.P.: Other:					
Engineering Controls: 					
Substances Evaluated					
Substance	Result	Substance	Result	Substance	Result
Observations and Comments					

QA by: _____

Date: _____

ATTACHMENT F
INCIDENT REPORTING

Windows Internet Explorer
 http://prdnet/noitrack/IncidentInfo.aspx

File Edit View Favorites Tools Help

Google Search Bookmarks Check AutoFill Sign In

NOITrack

Open NOI's Search Add New Incident Reports Admin Help Blog

Incident Info Individual Data Investigation File Attachment

☐ Near Incident

Fields marked with * are required

Security	Safety	Computer	Other
<input type="checkbox"/> Threat or Intimidation	<input type="checkbox"/> Vehicle	<input type="checkbox"/> Computer/Technology	<input type="checkbox"/> Environmental
<input type="checkbox"/> Act of Violence	<input type="checkbox"/> Injury	<input type="checkbox"/> Other	<input type="checkbox"/> Property/Equipment Damage
<input type="checkbox"/> Theft	<input type="checkbox"/> Illness		<input type="checkbox"/> Regulatory Agency
<input type="checkbox"/> Vandalism	<input type="checkbox"/> Exposure		<input type="checkbox"/> Other
<input type="checkbox"/> Violation of Company or Government Security	<input type="checkbox"/> Other Safety		

Requirements

☐ Other Security

Was this a single event or the latest in a series(describe)?

Note: This description is limited to 255 characters. If more information is required, add the information in the submitted description.

Date of Incident *

Time of Incident * Hrs min AM

☐ Unknown Date

☐ Unknown Time

Done Local intranet 100%

Please go to NOITrack using the following link to complete incident reporting. If you are in the field and do not have access to NOITrack, please contact someone in your office to do the reporting for you.

<http://prdnet/noitrack/IncidentInfo.aspx>

Questions can be directed to Susan Hipp-Ludwick at 610.701.3046 or Matt Dillon at 610.701.3667

ATTACHMENT G
AHA CHECKLIST AND ENVIRONMENTAL COMPLIANCE

HAZARD CHECKLIST Site Manager/EHS Officer:						Task Team (name or reference via daily sign-in sheet)			
Date: Location: Address:									
HAZARDS IDENTIFIED (check those applicable)									
	Chemical		Biological		Physical		Aerial lifts		Remote Areas
<input type="checkbox"/>	Flammable/combustible	<input type="checkbox"/>	Insects	<input type="checkbox"/>	Noise	<input type="checkbox"/>	Man. Material Handling	<input type="checkbox"/>	Materials handling
<input type="checkbox"/>	Corrosive	<input type="checkbox"/>	Animals	<input type="checkbox"/>	Heat	<input type="checkbox"/>	Demolition	<input type="checkbox"/>	High Pressure Washers
<input type="checkbox"/>	Oxidizer	<input type="checkbox"/>	Plants	<input type="checkbox"/>	Cold	<input type="checkbox"/>	Excavation	<input type="checkbox"/>	Hand and Power Tools
<input type="checkbox"/>	Reactive	<input type="checkbox"/>	Mold/Fungus	<input type="checkbox"/>	Inclement Weather	<input type="checkbox"/>	Pile Driving	<input type="checkbox"/>	Low Illumination
<input type="checkbox"/>	Toxic	<input type="checkbox"/>	Viral/Bacterial	<input type="checkbox"/>	Hot Work	<input type="checkbox"/>	Welding/Cutting/Burn	<input type="checkbox"/>	Drilling & Boring
<input type="checkbox"/>	Inhalation	<input type="checkbox"/>	Density Gauges	<input type="checkbox"/>	Confined Spaces	<input type="checkbox"/>	Hot Surfaces	<input type="checkbox"/>	Striking against/Struck-by
<input type="checkbox"/>	Eyes/Skin	<input type="checkbox"/>	Radiological	<input type="checkbox"/>	Stored hazardous Energy	<input type="checkbox"/>	Hot Materials	<input type="checkbox"/>	Caught-in/Caught between
<input type="checkbox"/>	Pesticides	<input type="checkbox"/>	Ultra-Violet	<input type="checkbox"/>	Elevation	<input type="checkbox"/>	Rough Terrain	<input type="checkbox"/>	Pushing/pulling
<input type="checkbox"/>	Carcinogen	<input type="checkbox"/>	Sunlight	<input type="checkbox"/>	Utilities	<input type="checkbox"/>	Compressed Gases	<input type="checkbox"/>	Falls at same level
<input type="checkbox"/>	Asbestos	<input type="checkbox"/>	Infrared	<input type="checkbox"/>	Machinery	<input type="checkbox"/>	Hazardous Mat. Storage	<input type="checkbox"/>	Falls from elevation
<input type="checkbox"/>	Lead	<input type="checkbox"/>	Lasers	<input type="checkbox"/>	Mobile equipment	<input type="checkbox"/>	Diving	<input type="checkbox"/>	Repetitive motion
<input type="checkbox"/>	UXO/OE/ CWM	<input type="checkbox"/>	XRF	<input type="checkbox"/>	Cranes	<input type="checkbox"/>	Operation of Boats	<input type="checkbox"/>	High (>110v) Electricity
<input type="checkbox"/>	Process Safety	<input type="checkbox"/>	Isotopes	<input type="checkbox"/>	Manual Material Handling	<input type="checkbox"/>	Working Over Water	<input type="checkbox"/>	Slippery surface Ice/Snow
<input type="checkbox"/>	Applying Paint/Coatings	<input type="checkbox"/>		<input type="checkbox"/>	Ladders	<input type="checkbox"/>	Traffic	<input type="checkbox"/>	
<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	Scaffolding	<input type="checkbox"/>	Site Security	<input type="checkbox"/>	
REQUIRED PROTECTION (check those applicable)									
	Engineering Controls		Administrative Control		PPE			Contingency	
<input type="checkbox"/>	Guard Rails	<input type="checkbox"/>	Qualified for task	<input type="checkbox"/>	Air Supplying Respirator	<input type="checkbox"/>	Tyvek coveralls	<input type="checkbox"/>	Emergency Signal Known
<input type="checkbox"/>	Machine Guards	<input type="checkbox"/>	Trained/Certified	<input type="checkbox"/>	Air Purifying Respirator	<input type="checkbox"/>	Coated Coveralls	<input type="checkbox"/>	Eye wash/shower Location
<input type="checkbox"/>	Sound Barriers	<input type="checkbox"/>	Hot Work Permit	<input type="checkbox"/>	SCBA	<input type="checkbox"/>	Welding leathers	<input type="checkbox"/>	First Aid Kit Location
<input type="checkbox"/>	Enclosure	<input type="checkbox"/>	CSE Permit	<input type="checkbox"/>	Hard Hat	<input type="checkbox"/>	CWM	<input type="checkbox"/>	Fire Extinguisher Location
<input type="checkbox"/>	Elevation	<input type="checkbox"/>	Lockout/Tag Out	<input type="checkbox"/>	Ear Plugs	<input type="checkbox"/>	Safety Shoes/Boots	<input type="checkbox"/>	Spill Kit Location
<input type="checkbox"/>	Isolation	<input type="checkbox"/>	Work Permit	<input type="checkbox"/>	Ear Muffs	<input type="checkbox"/>	Rubber Boots	<input type="checkbox"/>	Severe weather shelter
<input type="checkbox"/>	GFCI	<input type="checkbox"/>	Dig Safe Permit	<input type="checkbox"/>	Safety Glasses	<input type="checkbox"/>	Gloves	<input type="checkbox"/>	Evacuation Routes
<input type="checkbox"/>	Assured Ground Program	<input type="checkbox"/>	Contingency Plan	<input type="checkbox"/>	Goggles	<input type="checkbox"/>	Cooling Suits		
<input type="checkbox"/>	Apply Anti-slip/skid Mat	<input type="checkbox"/>	Critical Lift Plans	<input type="checkbox"/>	Chemical Goggles	<input type="checkbox"/>	Ice Vests		
		<input type="checkbox"/>	Equip. Inspection Sheets	<input type="checkbox"/>	Face Shield	<input type="checkbox"/>	Radiant heat Suits		
				<input type="checkbox"/>	Thermal Shield	<input type="checkbox"/>	Fall Arrest		
				<input type="checkbox"/>	Welding Mask	<input type="checkbox"/>	PFD		
				<input type="checkbox"/>	Cutting Glasses	<input type="checkbox"/>	Electrical insulation		
Any Modification to Tasks (list)			Other tasks or activities that may affect my activity			Reasons for any changes indicated above			

Environmental Compliance Considerations:

<input type="checkbox"/>	Generation of Hazardous Waste*	<input type="checkbox"/>	→Waste Identification & Manifesting - Marking, Placarding, Labeling
<input type="checkbox"/>	Generation of Investigation Derived Waste*	<input type="checkbox"/>	→Training & Licensing for Use of Radioactive Materials/Sources
<input type="checkbox"/>	Treatment, Storage, or Disposal of Hazardous Waste*	<input type="checkbox"/>	→ Containers: dated, labeled, closed, full, stored less than 90 days
<input type="checkbox"/>	Contingency to prevent or contain hazardous materials or oil spills or discharges to drains, body of water, soil*	<input type="checkbox"/>	→ Risk of explosion or catastrophic release due to chemical storage or processing involving reactivity, flammables, solvents or explosives
<input type="checkbox"/>	Disturbing of Asbestos Containing Materials (ACM)*	<input type="checkbox"/>	→Training & Licensing for Asbestos Remediation Activities
<input type="checkbox"/>	Application of Pesticides or Herbicides*	<input type="checkbox"/>	
<input type="checkbox"/>	Work on Above or Under-ground Storage Tanks*	<input type="checkbox"/>	
<input type="checkbox"/>	Transportation, Storage or Disposal of Radioactive Material*	<input type="checkbox"/>	
<input type="checkbox"/>	Activities producing or generating Air Emissions (or fugitive "fence-line" emissions) requiring either monitoring and/or permit*	<input type="checkbox"/>	
<input type="checkbox"/>	Excavations, Drilling, Probing or other activities that could impact underground utilities, pipelines, sewer or treatment systems.	<input type="checkbox"/>	
<input type="checkbox"/>	Shipment of Hazardous Waste off-site*	<input type="checkbox"/>	
<input type="checkbox"/>	Shipment of Samples in accordance with DOT/IATA	<input type="checkbox"/>	

* Indicates need for an environmental compliance plan.

ATTACHMENT H TRAFFIC CONTROL PLAN

Insert documents on following page.

ATTACHMENT I AUDIT FORMS

Insert documents on following page.

ATTACHMENT J
ENVIRONMENTAL HEALTH & SAFETY INSPECTION CHECKLIST

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

Project Name: _____

Inspector: _____

Submit to: _____

Date: _____

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

THE WESTON SITE APPEARANCE

YES	NO		COMMENT
<input type="checkbox"/>	<input type="checkbox"/>	Is the site secured to prevent inadvertent, unnecessary, or unauthorized access? Are gates closed and locked at any time that the access point is not occupied or visible to site workers?	
<input type="checkbox"/>	<input type="checkbox"/>	Are access points posted with signs to indicate client and end-user client name, WESTON's name and logo, names of other contractors and sub-contractors, project name and location, and appropriate safety messages?	
<input type="checkbox"/>	<input type="checkbox"/>	Are required postings in place (e.g., Labor Poster, Emergency Phone Numbers, Site Map, etc.)?	
<input type="checkbox"/>	<input type="checkbox"/>	Are site trailers tied down per local code and provided with stairs that have a landing platform with guard and stair railings?	
<input type="checkbox"/>	<input type="checkbox"/>	Is a Site Safety file system established in the office to maintain records required by applicable safety regulations	
<input type="checkbox"/>	<input type="checkbox"/>	Is the Health and Safety Plan (HASP) or Accident Prevention Plan (APP) amended as scope of work changes, hazards are discovered or eliminated or if risk change?	
<input type="checkbox"/>	<input type="checkbox"/>	Is the Site Safety Plan and the Safety Officers Field Manual on site?	
<input type="checkbox"/>	<input type="checkbox"/>	Is new employee indoctrination provided?	
<input type="checkbox"/>	<input type="checkbox"/>	Have site Rules been provided, discussed and signed off on by all employees	
<input type="checkbox"/>	<input type="checkbox"/>	Incident Reporting procedure explained to all?	
<input type="checkbox"/>	<input type="checkbox"/>	Is site management trained in the WESTON (and client as applicable) Incident Reporting system?	
<input type="checkbox"/>	<input type="checkbox"/>	Are NOI and Supplemental Report forms and OSHA 300 Log available on site?	
<input type="checkbox"/>	<input type="checkbox"/>	Is Site Management aware of the Case Management and Incident Investigation Procedures?	
<input type="checkbox"/>	<input type="checkbox"/>	Is there a list of preferred provider medical facilities available?	
<input type="checkbox"/>	<input type="checkbox"/>	Has the "Inspection By A Regulatory Agency" procedure been reviewed by all site management?	
<input type="checkbox"/>	<input type="checkbox"/>	Will Competent Persons be required because of activities to be performed, equipment to be used or hazards to be encountered?	

POLICIES

YES	NO		COMMENT
<input type="checkbox"/>	<input type="checkbox"/>	Each individual employee is aware that he or she responsible for complying with applicable safety requirements, wearing prescribed safety equipment and preventing avoidable accidents.	
<input type="checkbox"/>	<input type="checkbox"/>	Do employees understand that they will wear clothing suitable for existing weather and work conditions and the minimum work uniform will include long pants, sleeved work shirts, protective footwear, hard hat, and safety glasses unless otherwise specified via the HASP.	
<input type="checkbox"/>	<input type="checkbox"/>	Are employees provided safety and health training to enable them to perform their work safely ? Is all training documented to indicate the date of the session, topics covered, and names of participants?	
<input type="checkbox"/>	<input type="checkbox"/>	Safety meetings are conducted daily. The purpose of the meetings are to review past activities, review pertinent tailgate safety topics and establish safe working procedures for anticipated hazards encountered during the day.	
<input type="checkbox"/>	<input type="checkbox"/>	Training has been provided to all personnel regarding handling of emergency situations that may arise from the activity or use of equipment on the project.	
<input type="checkbox"/>	<input type="checkbox"/>	Employees/contractors are informed and understand that they may not be under the influence of alcohol, narcotics, intoxicants or similar mind-altering substances at any time. Employees found under the influence of or consuming such substances will be immediately removed from the job site.	
<input type="checkbox"/>	<input type="checkbox"/>	Site workers and operators of any equipment or vehicles are able to read and understand the signs, signals and operating instructions of their use.	
<input type="checkbox"/>	<input type="checkbox"/>	Have contractors performing work provided copies of relevant documentation (such as medical fit-for-duty, training certificates, fit-tests, etc.) prior to initiation of the project?	

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

SANITATION 29 CFR 1926 Subparts C, D. EM 385-1-1, Section 2

YES	NO		COMMENT
<input type="checkbox"/>	<input type="checkbox"/>	Is an adequate supply of drinking water provided. Is potable/drinking water labeled as such? Are there sufficient drinking cups provided?	
<input type="checkbox"/>	<input type="checkbox"/>	Is there a sufficient number of toilets?	
<input type="checkbox"/>	<input type="checkbox"/>	Are washing facilities readily available and appropriate for the cleaning needs?	
<input type="checkbox"/>	<input type="checkbox"/>	Are washing facilities kept sanitary with adequate cleansing and drying materials?	
<input type="checkbox"/>	<input type="checkbox"/>	Waste is secured so as not to attract rodents, insects or other vermin?	
<input type="checkbox"/>	<input type="checkbox"/>	Is an effective housekeeping program established and implemented?	

ACCIDENT PREVENTION SIGNS, TAGS, LABELS, SIGNALS, AND PIPING SYSTEM IDENTIFICATION 29 CFR 1926 Subpart G. EM 385-1-1, Section 8

YES	NO		COMMENT
<input type="checkbox"/>	<input type="checkbox"/>	Are signs, tags, and labels provided to give adequate warning and caution of hazards and instruction/directions to workers and the public?	
<input type="checkbox"/>	<input type="checkbox"/>	Are all employees informed as to the meaning of the various signs, tags and labels used in the workplace and what special precautions are required?	
<input type="checkbox"/>	<input type="checkbox"/>	Are construction areas posted with legible traffic signs at points of hazard?	
<input type="checkbox"/>	<input type="checkbox"/>	Are signs required to be seen at night lighted or reflectorized?	
<input type="checkbox"/>	<input type="checkbox"/>	Tags contain a signal word ("danger" or "caution") and a major message to indicate the specific hazardous condition or the instruction to be communicated to the employee. Tags follow requirements as outlined in 29 CFR 1926.200.	

MEDICAL SERVICES AND FIRST AID 29 CFR 1926 Subparts C, D. EM 385-1-1, Section 3

YES	NO		COMMENT
<input type="checkbox"/>	<input type="checkbox"/>	Is a local medical emergency facility (LMEF) identified in the HASP or APP?	
<input type="checkbox"/>	<input type="checkbox"/>	Has the LMEF been visited to verify the directions and establish contacts?	
<input type="checkbox"/>	<input type="checkbox"/>	Has site management reviewed WESTON's incident management procedures?	
<input type="checkbox"/>	<input type="checkbox"/>	Have clinics and specialists that will help WESTON manage injuries and illnesses been identified?	
<input type="checkbox"/>	<input type="checkbox"/>	Is there at least two (2) people certified in First Aid and CPR?	
<input type="checkbox"/>	<input type="checkbox"/>	Are first aid kits available at the command post and appropriate remote locations?	
<input type="checkbox"/>	<input type="checkbox"/>	Are first Aid Kits and Eyewash/Safety Showers inspected weekly?	
<input type="checkbox"/>	<input type="checkbox"/>	Are 15 minute eyewash/safety showers in place if required.	

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

FIRE PREVENTION AND PROTECTION 29 CFR 1926 Subpart F. EM 385-1-1, Section 9

YES	NO		COMMENT
<input type="checkbox"/>	<input type="checkbox"/>	Is an Emergency Response and Contingency Plan in place?	
<input type="checkbox"/>	<input type="checkbox"/>	Are emergency phone numbers posted?	
<input type="checkbox"/>	<input type="checkbox"/>	Are fire extinguishers selected and provided based on the types of materials and potential fire classes in each area.	
<input type="checkbox"/>	<input type="checkbox"/>	Are fire extinguishers provided in each administrative and storage trailer, within 50 ft but no closer than 25 ft of any fuel or flammable liquids storage, on welding and cutting equipment, on mechanical equipment?	
<input type="checkbox"/>	<input type="checkbox"/>	Are fire extinguishers checked daily and inspected monthly?	
<input type="checkbox"/>	<input type="checkbox"/>	Do site personnel know the location of fire extinguishers and how to use them?	
<input type="checkbox"/>	<input type="checkbox"/>	Are flammable and combustible liquids stored in approved containers?	
<input type="checkbox"/>	<input type="checkbox"/>	Safety cans are used for dispensing flammable or combustible liquids in 5 gallon or less volumes.	
<input type="checkbox"/>	<input type="checkbox"/>	Are flammable and combustible liquids stored in flammable storage cabinets or appropriate storage areas?	
<input type="checkbox"/>	<input type="checkbox"/>	Are flammable materials separated from oxidizers by at least 20 feet (or 5 foot tall, ½ -hour rated fire wall) when in storage?	
<input type="checkbox"/>	<input type="checkbox"/>	Are fuel storage tanks double walled or placed in a lined berm?	
<input type="checkbox"/>	<input type="checkbox"/>	Spills are cleaned up immediately and wastes are disposed of properly.	
<input type="checkbox"/>	<input type="checkbox"/>	Combustible scrap, debris and waste material (oily rags) are stored in closed metal containers and disposed of promptly.	
<input type="checkbox"/>	<input type="checkbox"/>	Vehicle fueling tanks are grounded and bonding between the tank and vehicle being fueled is provided?	
<input type="checkbox"/>	<input type="checkbox"/>	LPG is stored, handled and used according to OSHA regulations 29 CFR 1926.	
<input type="checkbox"/>	<input type="checkbox"/>	LPG cylinders are not stored indoors.	
<input type="checkbox"/>	<input type="checkbox"/>	Is a hot work permit program in place? See WESTON FLD-36	
<input type="checkbox"/>	<input type="checkbox"/>	Is smoking limited to specific areas, prohibited in flammable storage areas and are signs posted to this effect?	

HAZARDOUS SUBSTANCES, AGENTS AND ENVIRONMENTS 29 CFR 1926 Subparts D, Z. EM 385-1-1, Sections 6, 28

YES	NO		COMMENT
<input type="checkbox"/>	<input type="checkbox"/>	Are operations, materials and equipment evaluated to determine the presence of hazardous contaminants or if hazardous agents could be released in the work environment?	
<input type="checkbox"/>	<input type="checkbox"/>	Are MSDS for substances made available at the work-site when any hazardous substance is procured, used, or stored?.	
<input type="checkbox"/>	<input type="checkbox"/>	Are all containers and piping containing hazardous substances labeled appropriately?	
<input type="checkbox"/>	<input type="checkbox"/>	Is there an inventory of hazardous substances?	
<input type="checkbox"/>	<input type="checkbox"/>	Is there a site Specific Hazard Communication Program?	
<input type="checkbox"/>	<input type="checkbox"/>	Spill kits appropriate for the hazardous materials present are on site and their location is known to spill responders.	
<input type="checkbox"/>	<input type="checkbox"/>	Is disposal of excess hazardous chemicals performed according to WESTON's guidelines and RCRA regulations.	
<input type="checkbox"/>	<input type="checkbox"/>	Before initiation of activities where there is an identified asbestos or lead hazard, is there a written plan detailing compliance with OSHA and EPA asbestos or lead abatement requirements? Does the plan comply with state and local authority, and USACE requirements, as applicable?	
<input type="checkbox"/>	<input type="checkbox"/>	Are personnel trained and provided with protection against hazards from animals, poisonous plants and insects?	

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

PERSONAL PROTECTIVE AND SAFETY EQUIPMENT, RESPIRATORY AND FALL PROTECTION 29 CFR 1926 Subparts D, E, M. EM 385-1-1, Section 5

YES	NO		COMMENT
<input type="checkbox"/>	<input type="checkbox"/>	Do employees understand that the minimum PPE is hard hat, safety glasses with side shields and safety shoes or boots and that long pants and a sleeved shirt are required?	
<input type="checkbox"/>	<input type="checkbox"/>	Has the SSHC reviewed the PPE requirements in the HASP against actual site conditions and certified that the PPE is appropriate? (see Field Manual, PPE Program)	
<input type="checkbox"/>	<input type="checkbox"/>	PPE is inspected, tested and maintained in serviceable and sanitary condition as recommended by the manufacturer. Is defective or damaged equipment taken out of service and repaired or replaced?	
<input type="checkbox"/>	<input type="checkbox"/>	Are workers trained in the use of the PPE required?	
<input type="checkbox"/>	<input type="checkbox"/>	Are personnel exposed to vehicular or equipment traffic, including signal persons, spotters or inspectors required to vests or apparel marked with a reflective or high visibility material?	
<input type="checkbox"/>	<input type="checkbox"/>	Is there a noise hazard? If yes, hearing protection will be required.	
<input type="checkbox"/>	<input type="checkbox"/>	Is there a splash or splatter hazard? Face shields or goggles will be required.	
<input type="checkbox"/>	<input type="checkbox"/>	Will personnel be working in or over water? Personnel Floatation devices will be required.	
<input type="checkbox"/>	<input type="checkbox"/>	Is there a welding hazard? Welding helmet and leathers will be required. Is there a cutting torch hazard? Goggles and protective clothing will be required.	
<input type="checkbox"/>	<input type="checkbox"/>	Is each person on a walking/working surface with an unprotected side or edge which is 6 feet (1.8 m) or more above a lower level protected from falling by the use of guardrail systems, safety net systems or personal fall arrest systems? See WESTON FLD 25 (Note General Industry standard is four feet).	
<input type="checkbox"/>	<input type="checkbox"/>	Guardrail systems are used as primary protection whenever feasible. Guardrail construction meets criteria in 29 CFR 1926.502(b).	
<input type="checkbox"/>	<input type="checkbox"/>	Personal fall arrest systems (PFAS) are inspected and appropriate for use.	
<input type="checkbox"/>	<input type="checkbox"/>	Ropes and straps (webbing) used in lanyards, lifelines, and strength components of body belts and body harnesses are from synthetic fibers.	
<input type="checkbox"/>	<input type="checkbox"/>	Safety nets and safety net installations are constructed, tested and used according to 29 CFR 1926.502.c	
<input type="checkbox"/>	<input type="checkbox"/>	Is respirator use required? See WESTON Respiratory Protection Program	
<input type="checkbox"/>	<input type="checkbox"/>	Persons using respiratory protection have been successfully medically cleared, trained and fit tested.	
<input type="checkbox"/>	<input type="checkbox"/>	Respirators are used according to the manufacturer's instructions, regulatory requirements, selection criteria and health and safety plan provisions.	
<input type="checkbox"/>	<input type="checkbox"/>	For Level C operations with organic vapor contamination, is the cartridge change-out schedule documented?	
<input type="checkbox"/>	<input type="checkbox"/>	Is breathing certified as Grade D, or better, and certification available on-site?	

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

MACHINERY AND MECHANIZED EQUIPMENT 29 CFR 1926 Subparts N, O. EM 385-1-1, Sections 16, 17, 18

YES	NO	COMMENT
<input type="checkbox"/>	<input type="checkbox"/>	Are inspections of machinery by a competent person established?
<input type="checkbox"/>	<input type="checkbox"/>	Is equipment inspected daily before its next use?
<input type="checkbox"/>	<input type="checkbox"/>	Equipment inspection reports are reviewed, followed-up on negative findings and records of inspections are maintained?
<input type="checkbox"/>	<input type="checkbox"/>	Machinery or equipment found to be unsafe is taken out of service until the unsafe condition has been corrected.
<input type="checkbox"/>	<input type="checkbox"/>	Is there a preventive maintenance program established?
<input type="checkbox"/>	<input type="checkbox"/>	Are operators of equipment qualified and authorized to operate?
<input type="checkbox"/>	<input type="checkbox"/>	Is all self-propelled construction and industrial equipment equipped with a reverse signal alarm?
<input type="checkbox"/>	<input type="checkbox"/>	Are seats or equal protection provided for each person required to ride on equipment. Are seatbelts installed and worn on motor vehicles, as appropriate.
<input type="checkbox"/>	<input type="checkbox"/>	All equipment with windshields is equipped with powered wipers. If fogging or frosting is possible, operable defogging or defrosting devices are required.
<input type="checkbox"/>	<input type="checkbox"/>	Internal combustion engines are not operated in enclosed areas unless adequate ventilation are made. Air monitoring is conducted to assure safe working conditions.
<input type="checkbox"/>	<input type="checkbox"/>	Is each bulldozer, scraper, dragline, crane, motor grader, front-end loader, mechanical shovel, backhoe, or similar equipment equipped with at least one dry chemical or carbon dioxide fire extinguisher with a minimum rating of 5-B:C?
<input type="checkbox"/>	<input type="checkbox"/>	Will cranes or other lifting devices be used? If so, are the following documents available on site: 1) a copy of the operating manual, 2) load rating chart, 3) log book, 4) a copy of the last annual inspection and 5) the initial on-site inspection?
<input type="checkbox"/>	<input type="checkbox"/>	Do operators have certificates of training to operate the type of crane(s) to be used?
<input type="checkbox"/>	<input type="checkbox"/>	Is a signal person provided when the point of operation is not in full view of the vehicle, machine or equipment operator? When manual (hand) signals are used, is only one person designated to give signals to the operator?
<input type="checkbox"/>	<input type="checkbox"/>	Signal persons back one vehicle at a time. While under the control of a signal person, drivers do not back or maneuver until directed. Drivers stop if contact with the signal person is lost.
<input type="checkbox"/>	<input type="checkbox"/>	Is a critical lift plan prepared by a competent person whenever: a lift is not routine, or a lift exceeds 75% of a crane's capacity, a lift results in the load being out of the operator's line of sight, or a lift involves more than one crane, a man basket is used, or the operator believes there is a need for a critical lift plan.
<input type="checkbox"/>	<input type="checkbox"/>	Fork Lifts (Powered Industrial Trucks) - Will forklifts be used on site?
<input type="checkbox"/>	<input type="checkbox"/>	All fork lifts meet the requirements of design, construction, stability, inspection, testing, maintenance and operation as indicated in ANSI/ASME B56.1 Safety Standards for Low Lift and High Lift Trucks.
<input type="checkbox"/>	<input type="checkbox"/>	Do forklift operators have certificates of training?
<input type="checkbox"/>	<input type="checkbox"/>	Are pile driving operations conducted according to EM 385-1-1, Section 16.L?
<input type="checkbox"/>	<input type="checkbox"/>	Is drilling equipment operated, inspected, and maintained as specified in the manufacturer's operating manual? Is a copy of the manual available at the work-site? See also the Drilling Safety Guide in the Safety Officers Field Manual.
<input type="checkbox"/>	<input type="checkbox"/>	Are flag persons provided when operations or equipment on or near a highway expose workers to traffic hazards? Do flag persons and persons working in proximity to a road wear high visibility vests? Are persons exposed to highway vehicle traffic protected by signs in all directions warning of the presence of the flag persons and the work? Do signs and distances from the work zone conform to federal and local regulations?

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

MOTOR VEHICLES

29 CFR 1926 Subpart O. EM 385-1-1, Section 18

YES	NO		COMMENT
<input type="checkbox"/>	<input type="checkbox"/>	Motor vehicle operators have a valid permit, license, or certification of ability for the equipment being operated.	
<input type="checkbox"/>	<input type="checkbox"/>	Inspection, maintenance and repair is according to manufacturer's requirements by qualified persons.	
<input type="checkbox"/>	<input type="checkbox"/>	Vehicles are inspected on a scheduled maintenance program.	
<input type="checkbox"/>	<input type="checkbox"/>	Vehicles not in safe operating condition are removed from service until defects are corrected.	
<input type="checkbox"/>	<input type="checkbox"/>	Glass in windshields, windows, and doors is safety glass. Any cracked or broken glass is replaced.	
<input type="checkbox"/>	<input type="checkbox"/>	Seatbelts are installed and worn.	
<input type="checkbox"/>	<input type="checkbox"/>	The number of passengers in passenger-type vehicles does not exceed the number which can be seated.	
<input type="checkbox"/>	<input type="checkbox"/>	Trucks used to transport personnel have securely anchored seating, a rear endgate, and a guardrail.	
<input type="checkbox"/>	<input type="checkbox"/>	No person is permitted to ride with arms or legs outside of a vehicle body; in a standing position on the body; on running boards; seated on side fenders, cabs, cab shields, rear of the truck or on the load.	
<input type="checkbox"/>	<input type="checkbox"/>	ATV operators possess valid state drivers license, have completed an ATV training course prior to operation of the vehicle, and wear appropriate protective equipment such as helmets, boots, and gloves.	

EXCAVATING AND TRENCHING

29 CFR 1926 Subpart P. EM 385-1-1, Section 25

YES	NO		COMMENT
<input type="checkbox"/>	<input type="checkbox"/>	Has the known or estimated location of utility installations such as sewer, telephone, fuel, electric, water lines, or any other underground installations that may be expected to be encountered during excavation been determined before excavation? Have utility locations been verified by designated state services according to state regulations? Has the client provided clearance where state jurisdiction doesn't apply?	
<input type="checkbox"/>	<input type="checkbox"/>	Have overhead utilities in excavation areas been identified and either de-energized, shielded or barricaded so excavating equipment will not come within 10 feet?	
<input type="checkbox"/>	<input type="checkbox"/>	Are inspections of the excavation, the adjacent areas, and protective systems made daily and as necessary by a competent person?	
<input type="checkbox"/>	<input type="checkbox"/>	Are Protective systems in place as prescribed by the competent person?	
<input type="checkbox"/>	<input type="checkbox"/>	Is material removed from excavations managed so it will not overwhelm the protective systems?	
<input type="checkbox"/>	<input type="checkbox"/>	Are barriers provided between excavations and walkways?	
<input type="checkbox"/>	<input type="checkbox"/>	Are excavations by roadways barricaded to warn vehicles of presence or to prevent them from falling in?	
<input type="checkbox"/>	<input type="checkbox"/>	Is there a means of exit from the excavation every 25 feet?	
<input type="checkbox"/>	<input type="checkbox"/>	Is air-monitoring required? If yes, Is it performed?	

CONFINED SPACES

29 CFR 1910 Subpart J. EM 385-1-1, Section 6

YES	NO		COMMENT
<input type="checkbox"/>	<input type="checkbox"/>	Is there a Confined Space Entry Program in place?	
<input type="checkbox"/>	<input type="checkbox"/>	Are the confined Spaces identified and labeled?	
<input type="checkbox"/>	<input type="checkbox"/>	Will the Confined Spaces be entered?	
<input type="checkbox"/>	<input type="checkbox"/>	Is appropriate entry documentation used and on-file?	

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

ELECTRICAL

29 CFR 1926 Subpart K. EM 385-1-1, Section 11

YES	NO		COMMENT
<input type="checkbox"/>	<input type="checkbox"/>	Are electrical installations made according to the National Electrical Code and applicable local codes?	
<input type="checkbox"/>	<input type="checkbox"/>	Qualified electricians make all connections and perform all work within 10 feet of live electric equipment.	
<input type="checkbox"/>	<input type="checkbox"/>	Location of underground, overhead, under floor, behind wall electrical lines is known and communicated. Lines are documented by qualified person as de-energized where necessary.	
<input type="checkbox"/>	<input type="checkbox"/>	Workers understand they must not work near live parts of electric circuits, unless they are qualified as required by OSHA or are protected by de-energizing and grounding the parts, guarding the parts by insulation, or other effective means?	
<input type="checkbox"/>	<input type="checkbox"/>	Employees who regularly work on or around energized electrical equipment or lines are instructed in the cardiopulmonary resuscitation (CPR) methods.	
<input type="checkbox"/>	<input type="checkbox"/>	Workers are prohibited from working alone on energized lines or equipment over 600 volts.	
<input type="checkbox"/>	<input type="checkbox"/>	Are Ground-fault circuit interrupters (GFCI's) or is ground fault circuit protection provided to protect employees from ground-fault hazards for all 115 – 120 Volt, 15 and 20 amp receptacle outlets which are not a part of the permanent wiring of a building or structure at construction sites?	
<input type="checkbox"/>	<input type="checkbox"/>	Circuit breakers are labeled.	
<input type="checkbox"/>	<input type="checkbox"/>	Circuit breaker and all cabinets with exposed electric conductors are kept tightly closed.	
<input type="checkbox"/>	<input type="checkbox"/>	Unused openings (including conduit knockouts) in electrical enclosures and fittings are closed with appropriate covers, plugs or plates.	
<input type="checkbox"/>	<input type="checkbox"/>	Sufficient access and working space is provided and maintained about all electrical equipment to permit ready and safe operations and maintenance.	
<input type="checkbox"/>	<input type="checkbox"/>	Motors are located within sight of their controllers or controller disconnecting means are capable of being locked in the pen position or is a separate disconnecting means installed in the circuit within sight of the motor.	
<input type="checkbox"/>	<input type="checkbox"/>	Are visual inspections of extension cords and cord-and plug-connected equipment conducted daily? Is equipment found damaged or defective tagged and removed from service, and not used until repaired?	
<input type="checkbox"/>	<input type="checkbox"/>	Wet Areas - Is portable lighting used in wet or conductive locations, such as tanks or boilers operated at no more than 12 volts and protected by GFCIs.	
<input type="checkbox"/>	<input type="checkbox"/>	Are electrical installations in hazardous areas to NEC?	
<input type="checkbox"/>	<input type="checkbox"/>	Metal ladders and tools including tape measures or fabric with metal thread are prohibited where contact with energized electrically parts is possible.	
<input type="checkbox"/>	<input type="checkbox"/>	All extension cords are the three-wire type, designed and rated for hard or extra hard usage?	
<input type="checkbox"/>	<input type="checkbox"/>	Worn or frayed electrical cords or cables are taken out of service. Fastening with staples, hanging from nails or suspending extension cords by wire is prohibited.	
<input type="checkbox"/>	<input type="checkbox"/>	Electric wire/flexible cord passing through work areas is protected from damage such as foot traffic, vehicles, sharp corners, projections and pinching? Flexible cords and cables passing through holes are protected by bushings or fittings?	
<input type="checkbox"/>	<input type="checkbox"/>	Before an employee or contractor performs any service or maintenance on a system where the unexpected energizing, start up, or release of kinetic or stored energy could occur and cause injury or damage, the system is to be isolated. Only authorized persons may apply and remove lockouts and tags.	
<input type="checkbox"/>	<input type="checkbox"/>	Contractors planning to use hazardous energy control procedures submit their hazardous energy control plan to the WESTON site safety officer or designee before implementing lockout/tagout procedures.	
<input type="checkbox"/>	<input type="checkbox"/>	There is a site specific hazardous energy control plan that clearly and specifically outlines the scope, purpose, authorization, rules and techniques to be used for the control of hazardous energy.	
<input type="checkbox"/>	<input type="checkbox"/>	Workers possess the knowledge and skills required for the safe application, usage and removal of energy controls.	

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

WELDING AND CUTTING 29 CFR 1926 Subpart J. EM 385-1-1, Section 10

YES	NO		COMMENT
<input type="checkbox"/>	<input type="checkbox"/>	Prior to performing welding, cutting or any other heat or spark producing activity, an assessment of the area is made by a competent person to identify combustible materials and potential sources of flammable atmospheres.	
<input type="checkbox"/>	<input type="checkbox"/>	Welders, cutters and their supervisors are trained in the safe operation of their equipment, safe welding and cutting practices, hot work permit requirements, and fire protection.	
<input type="checkbox"/>	<input type="checkbox"/>	Welding and cutting equipment is inspected daily before use. Unsafe equipment is taken out of use, replaced or repaired.	
<input type="checkbox"/>	<input type="checkbox"/>	Workers and the public is shielded from welding rays, flashes, sparks, molten metal and slag.	
<input type="checkbox"/>	<input type="checkbox"/>	Employees performing welding, cutting or heating are protected by PPE appropriate for the hazards (e.g., respiratory, vision and skin protection).	
<input type="checkbox"/>	<input type="checkbox"/>	Compatible fire extinguishing equipment is provided in the immediate vicinity of welding or cutting operations.	
<input type="checkbox"/>	<input type="checkbox"/>	Drums, tanks, or other containers and equipment which have contained hazardous materials shall be thoroughly cleaned before welding or cutting. Cleaning shall be performed in accordance with NFPA 327, <u>Cleaning or Safeguarding Small Tanks and Containers</u> , ANSI/AWS F4.1, <u>Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances</u> , and applicable health and safety plan requirements.	

HAND AND POWER TOOL SAFETY 29 CFR 1926 Subpart I. EM 385-1-1, Section 13

YES	NO		COMMENT
<input type="checkbox"/>	<input type="checkbox"/>	Power tools are from a manufacturer listed by a nationally recognized testing laboratory for the specific application for which they are to be used.	
<input type="checkbox"/>	<input type="checkbox"/>	Hand & power tools are inspected, maintained, tested and determined to be in safe operating condition before use.	
<input type="checkbox"/>	<input type="checkbox"/>	Tools found to be unsafe are not used, tagged and repaired or destroyed.	
<input type="checkbox"/>	<input type="checkbox"/>	Users of tools are trained in safe use.	
<input type="checkbox"/>	<input type="checkbox"/>	Electrical tools have cords and plug connections in good repair.	
<input type="checkbox"/>	<input type="checkbox"/>	Electrical tools are effectively grounded or approved double insulated.	
<input type="checkbox"/>	<input type="checkbox"/>	Reciprocating, rotating, and moving parts of equipment are guarded if they may be accessed by employees or they otherwise create a hazard.	
<input type="checkbox"/>	<input type="checkbox"/>	Safety clips/retainers are installed and maintained on pneumatic impact tool connections.	
<input type="checkbox"/>	<input type="checkbox"/>	Chain saws have an automatic chain brake or anti-kickback device.	
<input type="checkbox"/>	<input type="checkbox"/>	Pneumatic and hydraulic hoses and fittings are inspected regularly.	
<input type="checkbox"/>	<input type="checkbox"/>	Employees who operate powder actuated tools are trained and carry valid operators cards.	
<input type="checkbox"/>	<input type="checkbox"/>	Powder activated tools are stored in individual locked containers, when not in use and are not loaded until ready to use.	
<input type="checkbox"/>	<input type="checkbox"/>	Powder actuated tools are inspected for obstructions or defects daily before use.	
<input type="checkbox"/>	<input type="checkbox"/>	Powder actuated tool operators have appropriate PPE.	

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

RIGGING 29 CFR 1926 Subpart H. EM 385-1-1, Section 15

YES	NO		COMMENT
<input type="checkbox"/>	<input type="checkbox"/>	Rigging equipment is inspected as specified by the manufacturer, by a qualified person, before use on each shift and as necessary to assure that it is safe.	
<input type="checkbox"/>	<input type="checkbox"/>	Defective equipment is removed from service.	
<input type="checkbox"/>	<input type="checkbox"/>	Rigging not in use is removed from the work area, properly stored, and maintained in good condition.	
<input type="checkbox"/>	<input type="checkbox"/>	Wire rope removed from service for defects is cut up or plainly marked as unfit for use as rigging.	
<input type="checkbox"/>	<input type="checkbox"/>	The number of saddle clips used to form eyes in wire rope conforms with Table H-20, are spaced evenly and the saddles are on the live side.	
<input type="checkbox"/>	<input type="checkbox"/>	Chain rigging has a tag clearly indicating load limits, is inspected before initial use, then weekly, and is of alloyed metal.	
<input type="checkbox"/>	<input type="checkbox"/>	Fiber rope rigging is not used if it is frozen or has been subject to acids or excessive heat.	
<input type="checkbox"/>	<input type="checkbox"/>	Slings and their fittings and fastenings are inspected before use on each shift and as needed during use.	
<input type="checkbox"/>	<input type="checkbox"/>	Drums, sheaves, and pulleys on rigging hardware are smooth and free of surface defects that can damage rigging.	

MATERIAL HANDLING, STORAGE, AND DISPOSAL 29 CFR 1926 Subpart H. EM 385-1-1, Section 14

YES	NO		COMMENT
<input type="checkbox"/>	<input type="checkbox"/>	Employees are trained in and use safe lifting techniques.	
<input type="checkbox"/>	<input type="checkbox"/>	Materials are not moved or suspended over workers unless positive precautions have been taken to protect workers.	
<input type="checkbox"/>	<input type="checkbox"/>	Conveyors are constructed, inspected, & maintained by qualified persons according to manufacturer's recommendations.	
<input type="checkbox"/>	<input type="checkbox"/>	All conveyors are to be equipped with emergency stopping devices.	
<input type="checkbox"/>	<input type="checkbox"/>	Hazardous exposed moving machine parts are guarded mechanically, electrically or by location.	
<input type="checkbox"/>	<input type="checkbox"/>	Controls are clearly marked and/or labeled to indicate the function controlled.	
<input type="checkbox"/>	<input type="checkbox"/>	Taglines are used for suspended loads where the movement may be hazardous to persons.	
<input type="checkbox"/>	<input type="checkbox"/>	Material in storage is protected from falling or collapse by effective stacking, blocking, cribbing, etc.	
<input type="checkbox"/>	<input type="checkbox"/>	Walkways and aisles are to be kept clear.	
<input type="checkbox"/>	<input type="checkbox"/>	Materials are not stored on scaffolds or runways in excess of normal placement or in excess of safe load limits.	
<input type="checkbox"/>	<input type="checkbox"/>	Work areas and means of access are maintained safe and orderly.	
<input type="checkbox"/>	<input type="checkbox"/>	Tools, materials, extension cords, hoses or debris do not cause tripping or other hazards.	
<input type="checkbox"/>	<input type="checkbox"/>	Storage and construction sites are kept free from the accumulation of combustible materials.	
<input type="checkbox"/>	<input type="checkbox"/>	Waste materials and rubbish are placed in containers or, if appropriate, in piles. Waste materials are disposed of in accord with applicable local, state, or federal requirements.	

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

FLOATING PLANT AND MARINE ACTIVITIES 29 CFR 1926 Subpart O. EM 385-1-1 Section 19

YES	NO		COMMENT
<input type="checkbox"/>	<input type="checkbox"/>	Floating plants that are regulated by the USCG have current inspections and certificates.	
<input type="checkbox"/>	<input type="checkbox"/>	Before any floating plant is brought to the job site and placed in service it is inspected and determined to be in safe operating condition	
<input type="checkbox"/>	<input type="checkbox"/>	Periodic inspections are made such that safe operating conditions are maintained. Strict compliance with EM 385-1-1, Section 19 is expected.	
<input type="checkbox"/>	<input type="checkbox"/>	Plans are in place for removing or securing the plant and evacuation of personnel endangered by severe weather and other marine emergencies such as; fire, flooding, man overboard, hazardous materials incidents, etc..	
<input type="checkbox"/>	<input type="checkbox"/>	Means of access are properly secured, guarded, and maintained free of slipping and tripping hazards.	
<input type="checkbox"/>	<input type="checkbox"/>	Dredging operations follow guidelines as established in EM 385-1-1, Section 19.D.	

PRESSURIZED EQUIPMENT AND SYSTEMS 29 CFR 1926 Subparts I, F. EM 385-1-1, Section 20

YES	NO		COMMENT
<input type="checkbox"/>	<input type="checkbox"/>	Pressurized equipment and systems are inspected before being placed into service.	
<input type="checkbox"/>	<input type="checkbox"/>	Pressurized equipment or systems found to be unsafe are tagged "Out of Service-Do Not Use".	
<input type="checkbox"/>	<input type="checkbox"/>	Systems and equipment are operated, inspected and maintained by qualified, designated personnel.	
<input type="checkbox"/>	<input type="checkbox"/>	Safe clearance, lockout/tagout procedures are followed as appropriate during maintenance or repair.	
<input type="checkbox"/>	<input type="checkbox"/>	Air hose, pipes, fittings are pressure-rated for the activity. Defective hoses are removed from service.	
<input type="checkbox"/>	<input type="checkbox"/>	Hoses aren't laid over ladders, steps, scaffolds, or walkways in a manner that creates a tripping hazard.	
<input type="checkbox"/>	<input type="checkbox"/>	The use of compressed air for personal cleaning is prohibited. The use of compressed air for other cleaning is restricted to less than 30 psig.	
<input type="checkbox"/>	<input type="checkbox"/>	Compressed gas cylinders are stored in well-ventilated locations.	
<input type="checkbox"/>	<input type="checkbox"/>	Cylinders in storage are separated from flammable or combustible liquids and from easily ignitable materials by at least 40 feet or by a minimum five feet tall, ½ -hour fire resistive partition.	
<input type="checkbox"/>	<input type="checkbox"/>	Stored cylinders containing oxidizing gases are separated from fuel gas cylinders by at least 20 feet or by a minimum five feet tall, ½ -hour fire resistive partition.	
<input type="checkbox"/>	<input type="checkbox"/>	Cylinder valve caps are in place when cylinders are in storage, in transit, or a regulator is not in place.	
<input type="checkbox"/>	<input type="checkbox"/>	Compressed gas cylinders in service are secured in substantial fixed or portable racks or hand trucks.	
<input type="checkbox"/>	<input type="checkbox"/>	Oxygen cylinders and fittings are kept away from, and free from oil and grease.	
<input type="checkbox"/>	<input type="checkbox"/>	Cylinder Storage areas are posted with the names of the gases in storage and with signs indicating "No Smoking or Open Flame".	
<input type="checkbox"/>	<input type="checkbox"/>	Cylinders are to be stored such that mechanical and corrosion damage is avoided. Cylinders are not to be stored in areas required as an egress path.	
<input type="checkbox"/>	<input type="checkbox"/>	Cylinders may be stored in the open outdoors, however, they must be protected from the ground to prevent corrosion and must be protected from temperatures that may exceed 125 degrees F.	

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

WORK PLATFORMS/SCAFFOLDS 29 CFR 1926 Subparts L, M, N. EM 385-1-1 Sections 21, 22

YES	NO	COMMENT
<input type="checkbox"/>	<input type="checkbox"/>	Work platforms are erected, used, inspected, tested, maintained and repaired according to manufacturer's requirements.
<input type="checkbox"/>	<input type="checkbox"/>	Construction, inspection, and disassembly of scaffolds is under the direction of a competent person.
<input type="checkbox"/>	<input type="checkbox"/>	Workers on scaffolding have been trained by a qualified person.
<input type="checkbox"/>	<input type="checkbox"/>	Scaffolds are erected on a firm and level surface and are square and plumb.
<input type="checkbox"/>	<input type="checkbox"/>	Scaffolds are not loaded in excess of rated capacity.
<input type="checkbox"/>	<input type="checkbox"/>	Working levels of work platforms are fully planked or decked.
<input type="checkbox"/>	<input type="checkbox"/>	Planks are in good condition and free from obvious defects.
<input type="checkbox"/>	<input type="checkbox"/>	Fabricated frame scaffolding four times higher than the base width is secured to building/structure according to manufacturer's instruction and/or OSHA requirements.
<input type="checkbox"/>	<input type="checkbox"/>	Working platforms of scaffolding over ten feet in height have guard rails meeting OSHA specifications. Fall protection is suggested at four feet or greater.
<input type="checkbox"/>	<input type="checkbox"/>	Scaffolding/work platforms are accessed by means of a properly secured ladder or equivalent. Built on ladders conform to scaffold ladder requirements. Climbing of braces is not allowed.
<input type="checkbox"/>	<input type="checkbox"/>	Crane supported work platforms are designed and used in accordance with OSHA standards.
<input type="checkbox"/>	<input type="checkbox"/>	Elevating work platforms are operated, inspected and maintained according to the equipment operations manual.
<input type="checkbox"/>	<input type="checkbox"/>	Employees working in aerial lifts remain firmly on the floor of the basket. Employees use fall protection while in an aerial lift basket.

WALKING AND WORKING SURFACES AND STAIRS 29 CFR 1926 Subparts L, M, X. EM 385-1-1, Sections 21, 22, 24

YES	NO	COMMENT
<input type="checkbox"/>	<input type="checkbox"/>	Work areas are clean, sanitary, and orderly
<input type="checkbox"/>	<input type="checkbox"/>	Work surfaces are kept dry or appropriate means are taken to assure the surfaces are slip-resistant
<input type="checkbox"/>	<input type="checkbox"/>	Accumulations of combustible dust are routinely removed.
<input type="checkbox"/>	<input type="checkbox"/>	Aisles and passageways are kept clear and marked as appropriate.
<input type="checkbox"/>	<input type="checkbox"/>	There is safe clearance for walking in aisles where motorized or mechanical handling equipment is operating.
<input type="checkbox"/>	<input type="checkbox"/>	Materials or equipment is stored in such a way that sharp projections will not interfere with the walkway.
<input type="checkbox"/>	<input type="checkbox"/>	Changes of direction or elevation are readily identifiable.
<input type="checkbox"/>	<input type="checkbox"/>	Aisles or walkways that pass near moving or operating machinery, welding operations or similar operations are arranged so employees will not be subjected to potential hazards.
<input type="checkbox"/>	<input type="checkbox"/>	Standard guardrails are provided wherever aisle or walkway surfaces are elevated more than 30 inches above any adjacent floor or the ground and bridges provided where workers must cross over conveyors and similar hazards.
<input type="checkbox"/>	<input type="checkbox"/>	There are standard stair rails or handrails on all stairways having four or more risers or with an elevation of 30 or more inches.
<input type="checkbox"/>	<input type="checkbox"/>	Stairways are at least 22 inches wide. (General Industry Standard)
<input type="checkbox"/>	<input type="checkbox"/>	Stairs angle no more than 50 and no less than 30 degrees, risers are uniform from top to bottom (plus or minus 1/4 inch) and are provided with a surface that renders them slip resistant.
<input type="checkbox"/>	<input type="checkbox"/>	Stairway handrails are not less than 36 inches above the leading edge of stair treads and have at least 3 inches of clearance

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

		between the handrails and the wall or surface they are mounted on.	
<input type="checkbox"/>	<input type="checkbox"/>	Where doors or gates open directly on a stairway, there is a platform provided so the swing of the door does not reduce the width of the platform to less than 20 inches.	
<input type="checkbox"/>	<input type="checkbox"/>	Where stairs or stairways exit directly into any area where vehicles may be operated, there are adequate barriers and warnings provided to prevent employees stepping into the path of traffic.	
<input type="checkbox"/>	<input type="checkbox"/>	Signs are posted showing the load capacity of elevated storage areas.	
<input type="checkbox"/>	<input type="checkbox"/>	An appropriate means of access and egress is provided for surfaces with 19 or more inches of elevation change.	
		Material on elevated surfaces is minimized, with that necessary for immediate work requirements piled, stacked or racked in a manner to prevent it from tipping, falling, collapsing, rolling or spreading.	

FLOOR AND WALL HOLES AND OPENINGS 29 CFR 1926 Subpart M. EM 385-1-1, Section 24

YES	NO		COMMENT
<input type="checkbox"/>	<input type="checkbox"/>	Floor and roof openings that persons can walk into or fall through are guarded by a physical barrier or covered.	
<input type="checkbox"/>	<input type="checkbox"/>	Holes (defined as equal to or greater than 2 inches in least dimension) where person could trip must be covered/protected.	
<input type="checkbox"/>	<input type="checkbox"/>	Unprotected sides and edges on a walking/working surface six feet or more (note four feet in General Industry) are protected by guardrail system, safety net or Personal Fall Arrest System (PFAS).	
<input type="checkbox"/>	<input type="checkbox"/>	Unused portions of service pits and pits not actually in use are either covered or protected by guardrails or equivalent.	
<input type="checkbox"/>	<input type="checkbox"/>	Coverings for holes or other openings must be constructed of sufficient strength to support any anticipated load, must be secured in place to prevent accidental removal or displacement and must be marked indicating purpose (e.g., stenciled "Hole" or painted contrasting color to surroundings).	

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

LADDERS

29 CFR 1926 Subpart X. EM 385-1-1, Section 21

YES	NO		COMMENT
<input type="checkbox"/>	<input type="checkbox"/>	Portable ladders are used for their designed purpose only.	
<input type="checkbox"/>	<input type="checkbox"/>	Portable ladders are examined for defects prior to, and after use.	
<input type="checkbox"/>	<input type="checkbox"/>	Ladders found to be defective are clearly tagged to indicate "DO NOT USE" if repairable, or destroyed immediately if no repair is possible.	
<input type="checkbox"/>	<input type="checkbox"/>	Workers are trained in hazards associated with ladder use and how to inspect ladders.	
<input type="checkbox"/>	<input type="checkbox"/>	Ladders have secure footing provided by a combination of safety feet, top of ladder tie-offs and mud cills or a person holding the ladder to prevent slipping.	
<input type="checkbox"/>	<input type="checkbox"/>	The handrails of a straight ladder used to get from one level to another extend at least 36 inches above the landing.	
<input type="checkbox"/>	<input type="checkbox"/>	Ladders conform to construction criteria of ANSI Standards A-14.1 and A-14.2.	
<input type="checkbox"/>	<input type="checkbox"/>	Wooden ladders are not painted with an opaque covering such that signs of flaws, cracks or drying are obscured.	
<input type="checkbox"/>	<input type="checkbox"/>	Fixed ladders are constructed and used according to OSHA Standards, 29 CFR 1910.27 and ANSI A-14.3.	
<input type="checkbox"/>	<input type="checkbox"/>	Rungs, cleats or steps, and side rails that may be used for handholds when climbing, offer adequate gripping surface and are free of splinters, splivers or burrs, and substances that could cause slipping.	
<input type="checkbox"/>	<input type="checkbox"/>	Fixed ladders of greater than 24 feet have cages or other approved fall protection devices. (note General Industry is 20 feet).	
<input type="checkbox"/>	<input type="checkbox"/>	Where fall protection is provided by ladder safety systems (body belts or harnesses, lanyards and braking devices with safety lines or rails), systems meet the requirements of and are used in accordance with WESTON Fall Protection Standard Practices and are compatible with construction of the ladder system.	

DEMOLITION

29 CFR 1926 Subpart T. EM 385-1-1, Section 23

YES	NO		COMMENT
<input type="checkbox"/>	<input type="checkbox"/>	Prior to initiating demolition activities an engineering survey (by a competent person) and a demolition plan (by a competent person) is completed.	
<input type="checkbox"/>	<input type="checkbox"/>	All employees engaged in demolition activities are instructed in the demolition plan.	
<input type="checkbox"/>	<input type="checkbox"/>	It has been determined through the engineering survey and outlined in the plan, if any hazardous materials, or conditions (e.g., asbestos, lead, utility connections, etc.) exist. Such hazards are controlled or eliminated before demolition is started.	
<input type="checkbox"/>	<input type="checkbox"/>	Continued inspections, by a competent person, are conducted to ensure safe employee working conditions.	

TREE MAINTENANCE AND REMOVAL

29 CFR 1910 Subpart R. EM 385-1-1, Section 31

YES	NO		COMMENT
<input type="checkbox"/>	<input type="checkbox"/>	Tree maintenance or removal is done is under the direction of a qualified person.	
<input type="checkbox"/>	<input type="checkbox"/>	Tree work, in the vicinity of charged electric lines, is by trained persons qualified to work with electricity and tree work. Appropriate distances are maintained for all workers who are not qualified.	
<input type="checkbox"/>	<input type="checkbox"/>	Equipment is inspected, maintained, repaired and used in accordance with the manufacture's directions.	
<input type="checkbox"/>	<input type="checkbox"/>	Prior to felling actions are planned to include clearing of the area to permit safe working conditions and escape.	
<input type="checkbox"/>	<input type="checkbox"/>	Employees must be trained in the safe operation of all equipment.	
<input type="checkbox"/>	<input type="checkbox"/>	All equipment and machinery is inspected and determined safe prior to use.	
<input type="checkbox"/>	<input type="checkbox"/>	Work is performed under requirements of FLD 43.	

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

BLASTING

29 CFR 1926 Subpart U. EM 385-1-1, Section 29

YES	NO		COMMENT
<input type="checkbox"/>	<input type="checkbox"/>	A blasting safety plan is developed prior to bringing explosives on-site.	
<input type="checkbox"/>	<input type="checkbox"/>	The transportation, handling, storage, and use of explosives, blasting agents, and blasting equipment must be directed and supervised by a person with proven experience and ability in blasting operations. Licensing of person is verified.	
<input type="checkbox"/>	<input type="checkbox"/>	Blasting operations in or adjacent to cofferdams, piers, underwater structures, buildings, structures, or other facilities must be carefully planned with full consideration to potential vibration and damage.	

HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE AND UNDERGROUND STORAGE TANK (UST) ACTIVITIES

29 CFR 1926 Subpart D. EM 385-1-1, Section 28

YES	NO		COMMENT
<input type="checkbox"/>	<input type="checkbox"/>	All construction activities performed with known or potential exposure to hazardous waste are conducted in accordance with Hazardous Waste Operations and Emergency Response requirements.	

CONCRETE and MASONRY CONSTRUCTION

29 CFR 1926 Subpart Q. EM 385-1-1, Section 27

YES	NO		COMMENT
<input type="checkbox"/>	<input type="checkbox"/>	Construction loads are not placed on a concrete or masonry structure or portion of a concrete or masonry structure unless the employer determines, based on information from a person who is qualified in structural design, that the structure or portion of the structure is capable of supporting the loads.	
<input type="checkbox"/>	<input type="checkbox"/>	Employees are not permitted to work above or in positions exposed to protruding reinforcing steel or other impalement hazards unless provisions have been made to control the hazard.	
<input type="checkbox"/>	<input type="checkbox"/>	Sections of concrete conveyances and airlines under pressure are secured with wire rope (or equivalent material) in addition to the regular couplings or connections.	
<input type="checkbox"/>	<input type="checkbox"/>	Structural and reinforcing steel for walls, piers, columns, and similar vertical structures is supported and/or guyed to prevent overturning or collapse	
<input type="checkbox"/>	<input type="checkbox"/>	All form-work, shoring, and bracing is designed, fabricated, erected, supported, braced, and maintained so it will safely support all vertical and lateral loads that may be applied until the loads can be supported by the structure.	
<input type="checkbox"/>	<input type="checkbox"/>	Shoring equipment is inspected prior to erection to determine that it is specified in the shoring design. Any equipment found to be damaged is not used.	
<input type="checkbox"/>	<input type="checkbox"/>	Erected shoring equipment is inspected immediately prior to, during, and immediately after the placement of concrete. Any shoring equipment that is found to be damaged, displaced, or weakened is immediately reinforced or re-shored.	
<input type="checkbox"/>	<input type="checkbox"/>	Shoring, vertical slip forms and jacks conform with requirements of Section 27.B.08-13 of USACE EM 385-1-1.	
<input type="checkbox"/>	<input type="checkbox"/>	Forms and shores (except those on slab or grade and slip forms) are not removed until the individual responsible for forming and/or shoring determines that the concrete has gained sufficient strength to support its weight and all superimposed loads.	
<input type="checkbox"/>	<input type="checkbox"/>	Precast concrete members are adequately supported to prevent overturning or collapse until permanent connections are complete	
<input type="checkbox"/>	<input type="checkbox"/>	No one is permitted under pre-cast concrete members being lifted or tilted into position except employees required for the erection of those members.	
<input type="checkbox"/>	<input type="checkbox"/>	Lift slab operations are planned and designed by a registered engineer or architect.	
<input type="checkbox"/>	<input type="checkbox"/>	Hydraulic jacks used in lift slab construction have a safety device that causes the jacks to support the load in any position if the jack malfunctions	
<input type="checkbox"/>	<input type="checkbox"/>	No one is permitted under the slab during jacking operations.	
<input type="checkbox"/>	<input type="checkbox"/>	A limited access zone is established whenever a masonry wall is being constructed.	
<input type="checkbox"/>	<input type="checkbox"/>	Fall protection is provided to masonry workers exposed to falls of 6 feet or more.	

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

STEEL ERECTION

29 CFR 1926 Subpart R. EM 385-1-1, Section 27

YES	NO		COMMENT
<input type="checkbox"/>	<input type="checkbox"/>	Impact wrenches have a locking device for retaining the socket. Containers shall be provided for storing or carrying rivets, bolts, and drift pins, and secured against accidental displacement when aloft.	
<input type="checkbox"/>	<input type="checkbox"/>	Structural and reinforcing steel for walls, piers, columns, and similar vertical structures shall be guyed and supported to prevent collapse	
<input type="checkbox"/>	<input type="checkbox"/>	No loading is placed upon steel joists until all bridging is completely and permanently installed.	
<input type="checkbox"/>	<input type="checkbox"/>	Workers are provided fall protection whenever they are exposed to falls of 1.8 m (6 ft) or more (EM 385-1-1).	
<input type="checkbox"/>	<input type="checkbox"/>	Temporary flooring in skeleton steel erection conforms with Section 27.F of USACE 385-1-1	

ROOFING

29 CFR 1926 Subpart M. EM 385-1-1, Sections 21, 22, 24, 27

Yes	No		Comments
<input type="checkbox"/>	<input type="checkbox"/>	In the construction, maintenance, repair, and demolition, of roofs, fall protection systems is provided that will prevent personnel from slipping and falling from the roof and prevent personnel on lower levels from being struck by falling objects	
<input type="checkbox"/>	<input type="checkbox"/>	On all roofs greater than 4.8 m (16 ft) in height, a hoisting device, stairways, or progressive platforms are furnished for supplying materials and equipment.	
<input type="checkbox"/>	<input type="checkbox"/>	Roofing materials and accessories that could be moved by the wind, including metal roofing panels, that are on the roof and unattached are secured when wind speeds are greater than, or are anticipated to exceed, 10 mph.	
<input type="checkbox"/>	<input type="checkbox"/>	Level, guarded platforms are provided at the landing area on the roof.	
<input type="checkbox"/>	<input type="checkbox"/>	When their use is permitted, warning line systems comply with USACE Section 27.07 of EM 385-1-1.	
<input type="checkbox"/>	<input type="checkbox"/>	Workers involved in roof-edge materials handling or working in a storage area located on a roof with a slope \neq to four vertical to twelve horizontal and with edges 6 ft or more above lower levels are protected by the use of a guardrail, safety net, or personal fall arrest system along all unprotected roof sides and edges of the area.	

ENVIRONMENTAL HEALTH AND SAFETY INSPECTION CHECKLIST

ENVIRONMENTAL COMPLIANCE

Yes	No		Comments
<input type="checkbox"/>	<input type="checkbox"/>	Environmental Compliance and Waste Management Plan on file.	
<input type="checkbox"/>	<input type="checkbox"/>	Waste Determination Made.	
<input type="checkbox"/>	<input type="checkbox"/>	Manifest and/or Shipping Papers prepared and filed.	
<input type="checkbox"/>	<input type="checkbox"/>	Manifest Exception Reports Prepared, as necessary. Procedures to track manifests in place.	
<input type="checkbox"/>	<input type="checkbox"/>	State Annual and EPA Biennial Reporting Information Available.	
<input type="checkbox"/>	<input type="checkbox"/>	RCRA Personnel Training Records on file.	
<input type="checkbox"/>	<input type="checkbox"/>	CAA Permits on file.	
<input type="checkbox"/>	<input type="checkbox"/>	CWA Permits on file.	
<input type="checkbox"/>	<input type="checkbox"/>	RCRA Permits on file.	
<input type="checkbox"/>	<input type="checkbox"/>	State and/or Local Permits on file.	
<input type="checkbox"/>	<input type="checkbox"/>	RCRA Inspections conducted and Documentation on file.	
<input type="checkbox"/>	<input type="checkbox"/>	Transporter and TSD compliance information on file.	
<input type="checkbox"/>	<input type="checkbox"/>	Waste Accumulation Areas Managed Properly.	
<input type="checkbox"/>	<input type="checkbox"/>	Wetlands Areas Identified and Protected.	
<input type="checkbox"/>	<input type="checkbox"/>	Endangered, Threatened or Special Concern Species or Areas Identified and Protective Methods Determined.	
<input type="checkbox"/>	<input type="checkbox"/>	Runon and Runoff Concerns Identified and Managed.	
<input type="checkbox"/>	<input type="checkbox"/>	Adjacent Land Areas Protected as Necessary.	
<input type="checkbox"/>	<input type="checkbox"/>	Non-Hazardous Solid Wastes Managed Properly.	

MISCELLANEOUS REGULATORY and POLICY COMPLIANCE

Yes	No		Comments
<input type="checkbox"/>	<input type="checkbox"/>	Personnel Training Records for DOT Materials Handling on file.	
<input type="checkbox"/>	<input type="checkbox"/>	Noise Control Issues Addressed and Managed.	
<input type="checkbox"/>	<input type="checkbox"/>	Site Security Issues Identified and Managed.	
<input type="checkbox"/>	<input type="checkbox"/>	Known Historical, Archeological and Cultural Resources Identified and Managed.	
<input type="checkbox"/>	<input type="checkbox"/>	WESTON EHS Analysis Checklist In Use.	
<input type="checkbox"/>	<input type="checkbox"/>	Safety Observation and Recognition Program in place.	
<input type="checkbox"/>	<input type="checkbox"/>	Weekly EHS Report Card System in place.	
<input type="checkbox"/>	<input type="checkbox"/>	Federal, State and Local Required Postings in place.	
<input type="checkbox"/>	<input type="checkbox"/>	Site specific Lockout/Tagout Program is in place.	
<input type="checkbox"/>	<input type="checkbox"/>	Site-specific Confined Space Program is in place.	
<input type="checkbox"/>	<input type="checkbox"/>	Site Safety Officer filing system is in place and up to date.	

ATTACHMENT K
ENVIRONMENTAL PROTECTION AND SUSTAINABILITY PROGRAM
IMPACT CHECKLIST

ENVIRONMENTAL PROTECTION AND SUSTAINABILITY PROGRAM IMPACT CHECKLIST

PRE-PROPOSAL and EHS COMPLIANCE PLANNING

1. BACKGROUND

- a. Client name, address, phone number, and Point of Contact:
- b. Name/Identifier of proposal, if applicable:
- c. Prepared by:

2. DESCRIPTION

- a. Description, justification for, and location of Scope of Work in the proposal (i.e. training, activity, construction, regulation, license; include site location map):
- b. Environmental setting and present land use of the proposed site:

3. KNOWN OR POTENTIAL EHS IMPACTS:

Note that this checklist cannot completely anticipate all regulatory requirements, and that use of this checklist outlines only certain Federal criteria of specific interest (it is by no means a complete listing). State and local requirements must be evaluated also.

- The **Project Manager and Project Team** are responsible for evaluating project-specific environmental, health and safety needs that may be beyond those outlined in this checklist.
- Assistance is available through the Division Environmental, Health, and Safety (EHS) Managers and Corporate EHS Department. Early engagement of EHS support is a key to success.
- “Yes” responses will require a plan to address a specific issue. “No” responses must be based upon specific knowledge. “Unknown” responses require appropriate follow-up for confirmation.

3.1 Clean Air Act (CAA)

The basic purpose of the CAA is to control air pollution by instituting point source controls (fixed and/or mobile) and establishing maximum pollutant levels for the ambient air. Permits to construct and/or operate are required for sources that meet regulatory requirements. These sources include, but may not be limited to: major stationary sources, hazardous air pollution sources, and sources subject to new source performance standards.

Yes	No	Unknown	Criteria for Evaluation
General and Miscellaneous			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project release contaminants to the air from a new or existing source of air contaminants?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Does the project have the potential for deterioration of air quality?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will there be the introduction of smoke, suspended particles, or noxious gases/vapors (e.g., open burning, open detonation, etc.)?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will there be real or potential for particulate/dust migration beyond facility/site boundaries?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will WESTON own or operate a source of air emissions (e.g., air stripper, incinerator, thermal desorption system, soil vapor extraction system, fuel tanks or dispensers, electric generators, turbines) or disturb land?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will WESTON own or operate an air pollution control device (e.g., scrubber, vapor-phase activated carbon system)?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is fugitive emissions and/or perimeter air monitoring specified in the scope of work?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Has client specified air monitoring methods or real-time monitoring?
Prevention of Significant Deterioration (PSD) Permits (40 CFR 52)			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is site within an attainment area? (See 40 CFR 81.301-356).
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve construction or operation of a new major source with the potential to emit more than 100 tons/year for those specific listed emissions sources or 250 tons/year for all other emission sources types or a major modification of an existing major source with pollutant emission increases exceeding Prevention of Significant Deterioration (PSD) rates? (see 40 CFR 52.21(b) and/or CAA Section 169).
Non-Attainment Permits (40 CFR 52)			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is site within a non-attainment area? (See 40 CFR 81.301-356). If known, indicate which criteria pollutant(s) are not met.
New Source Performance Standards (40 CFR 60)			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve the release of contaminants to the air from a new or modified non-exempt source?
NESHAPS Standards for Air Toxics (40 CFR 61, 63) See also TSCA and OSHA			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve the demolition or renovation of any structure containing asbestos?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve a stationary source or group of stationary sources with the potential to emit 10 or more tons/year of a single HAP, or 25 tpy or more of multiple HAPs?
Accidental Release and Risk Management Planning (40 CFR 68)			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve storage and/or use of any chemical listed under 40 CFR 68.115 at or greater than its Threshold Planning Quantity (TPQ)?
Operating Permits (40 CFR 70, 71)			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve obtaining any permit as required under the CAA?
Reduction in Use of Ozone Depleting Substances (40 CFR 82)			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will site tasks involve repair, maintenance or decommissioning of objects containing ozone depleting substances (e.g., air conditioning/heat pump/refrigeration systems)?

State-Specific Requirements

As with many environmental regulations, States may have specific and/or additional regulations and laws associated with air and air quality. Remember to evaluate State and/or Local requirements.

3.2 Clean Water Act

The stated objective of the Act is to restore and maintain the chemical, physical, and biological integrity of the Nation's water by regulating discharges of pollutants into water bodies. Major requirements to plan for include; point source discharges, stormwater discharges, pretreatment prior to sewer system discharge, spill prevention and response, and wetland modification and/or dredge and fill activities.

Yes	No	Unknown	Criteria for Evaluation
General and Miscellaneous			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project location involve fresh water, marine environment, ground water impact or other?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve impact to water movement (e.g., construction of dam)?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve any change in the quantity and/or quality of ground water?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is there any potential for spills of hazardous materials/substances/wastes that could subsequently impact water quality (surface or ground)?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve any impact to wetlands or floodplains?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is the project in a well head protection area?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will there be any injection of waste materials into the ground?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will unimproved roads or new haul roads be required?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve the disruption, displacement or compaction of soil?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve a change in topography at the site?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project create an increase in wind or water erosion of soils (either on or off-site)?
NPDES Point Source Discharge Permit (40 CFR 122)			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve a point source discharge into surface water?
Stormwater Discharge Permit (40 CFR 122.26)			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve an industrial facility with potential for stormwater discharges to surface water or to a storm sewer system?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve the disturbance of one or more acres of land?
Pretreatment Requirements (40 CFR 403)			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will there be a discharge (e.g., process water, groundwater, cooling water) to a sewer authority or public sewer system? (Do not include proper connections from domestic-type sources such as toilets or kitchens).
Discharge of Oil and SPCC Plans (40 CFR 110, 112)			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will oil or petroleum products be stored at the site/operation?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the storage capacity of oil or petroleum products exceed 1320 gallons in above ground storage (include only containers equal to or larger than 55 gallons), or 42000 gallons underground?
Wetlands Modification and/or Dredge and Fill Requirements (40 CFR 230-233)			

Yes	No	Unknown	Criteria for Evaluation
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve excavation in or the discharge or dredge or fill material into water or wetlands?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve site clearing, or dredging or filling on/near water or wetlands?

State Requirements

As with many environmental regulations, States have specific regulations and laws associated with water protection and quality. Remember to evaluate State and/or Local requirements.

3.3 Safe Drinking Water Act (SDWA)

The SDWA regulates the quality of drinking water. Requirements typically relate to providing public drinking water, waste disposal in underground injection wells and establishing criteria for CERCLA remediation.

Yes	No	Unknown	Criteria for Evaluation
Public Water Supplies and Drinking Water Standards (40 CFR 141-143)			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will WESTON be providing a drinking water supply to the public?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve operating a public water supply system that has 15 or more services or serves more than 25 people per day for more than 60 days per year?
Sole-Source Aquifer Protection (40 CFR 149)			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve the discharge of contaminants onto or into areas classified as a sole-source aquifer?
Underground Well Injection (40 CFR 144-148)			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve the placing of fluids into a bored, drilled, driven or dug well?

State Requirements

In addition to compliance (and/or more restrictive) with above Federal criteria, States are responsible for implementing and enforcing well-head protection standards.

3.4 Resource Conservation and Recovery Act (RCRA)

RCRA provides the classic "cradle-to-grave" concept for waste materials, i.e., management of the waste material from generation to final disposal. RCRA requirements apply to those who generate, transport, store and dispose of wastes. Permits and identification numbers may be required for all categories with limited exceptions.

Yes	No	Unknown	Criteria for Evaluation
Non-Hazardous Solid Wastes (40 CFR 257, 258)			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will WESTON or the site generate any non-hazardous solid wastes?
Universal Wastes (40 CFR 273)			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will WESTON, or the site generate any universal wastes?
Hazardous Wastes Generation and Management (40 CFR 260-262)			

Yes	No	Unknown	Criteria for Evaluation
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will WESTON generate any hazardous wastes?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will WESTON be responsible for managing hazardous wastes generated by the client?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will site activities result in quantities that result in Conditionally Exempt Small Quantity Generator (CESQG), Small Quantity Generator (SQG), or Large Quantity Generator (LQG).
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Has on-site accumulation of waste stream (areas, containers or other device) been evaluated?
Hazardous Waste Treatment and Disposal Permit (40 CFR 264-270)			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will on-site treatment of waste(s) be conducted?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If off-site disposal has TSDf been evaluated and accepted?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve clean-up of hazardous waste or hazardous waste constituents from a RCRA-regulated facility?
Hazardous Waste Transportation (40 CFR 263)			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will WESTON be responsible for preparing hazardous wastes for transportation?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If transporting wastes, has transporter been evaluated and accepted?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will WESTON sign manifest? If yes, as Generator or as "Agent" for client?
Underground Storage Tanks (USTs) (40 CFR 280)			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will WESTON activities involve the installation, use, maintenance, spill or release clean-up, or decommissioning of a UST storing petroleum or CERCLA-listed hazardous substance?
Used Oil (40 CFR 279)			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will site activities involve the generation, storage or transportation of used/waste oil?
Land Disposal Restrictions (40 CFR 268)			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve the generation of wastes meeting Land Disposal Restriction (LDR) criteria?

State Requirements

Most States have primacy for both hazardous and non-hazardous solid waste; ensure knowledge of specific state requirements for such waste streams.

3.5 Comprehensive Environmental Response Compensation and Liability Act (CERCLA)

CERCLA provides a mechanism to clean up uncontrolled or abandoned contaminated sites and hold potentially responsible parties accountable for clean-up costs.

Yes	No	Unknown	Criteria for Evaluation
Release Reporting (40 CFR 300, 302)			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are any of the chemicals stored or used on site listed as a hazardous substance (40 CFR 302.4)?

Yes	No	Unknown	Criteria for Evaluation
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is there a potential for an unpermitted release of a hazardous substance to the environment in excess of its 24-hour Reportable Quantity (RQ)?
Remediation Efforts (40 CFR 300)			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are site remediation efforts under control of Federal Government?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are site remediation efforts under control of a State or Local Government?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are site remediation efforts under Private control?

State Requirements

Many states have enacted Superfund-type programs. Although many are similar to the Federal program, others may have significant differences to include broader ranges of hazardous substances.

3.6 Emergency Planning and Community Right to Know (EPCRA)

EPCRA established a process for developing state and local emergency planning and information programs on hazardous chemicals located at and/or emitted from facilities. Planning requirements apply to any facility that produces, uses or stores threshold quantities or more of any substance on the EPA list of extremely hazardous substances. There are also requirements for facilities that are required to maintain Material Safety Data Sheets (MSDSs) to notify the local fire department of those materials.

Yes	No	Unknown	Criteria for Evaluation
General			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will WESTON or WESTON subcontractor have chemicals on site?
Emergency Planning Notifications (40 CFR 355)			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Do any of the chemicals used or stored on site meet the definition of a hazardous substance and meet or exceed the threshold planning quantity (TPQ) for that chemical or 500 pounds, whichever is lower? (See 40 CFR Part 355 Appendix A and B). <i>If inventory meets criteria (material and quantity) then reports to LEPC, local Fire Department, and SERC are required. (See 40 CFR 370.21).</i>
Emergency Release Notifications (40 CFR 370)			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is there the potential for a release of listed substances (see 40 CFR 355, Appendices A and B and 40 CFR 302) that could result in exposure to persons off-site?
Community Right to Know/Hazardous Chemical Inventory Reporting (40 CFR 370)			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	At any point in time is any chemical in a quantity at or more than 10,000 pounds that requires an MSDS?

State Requirements

There are specific reporting and documentation requirements under EPCRA for state and local entities.

3.7 Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

The purpose of FIFRA is to protect public health and the environment from the misuse of pesticides by regulating the labeling and registration of pesticides. In addition to data necessary for the registration of pesticides sold there are requirements for the certification of applicators of those pesticides listed as restricted use.

Yes	No	Unknown	Criteria for Evaluation
Labeling and Packaging Requirements (40 CFR 156, 157)			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Does the project involve the use or application of pesticides?
Certification of Applicators (40 CFR 171)			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is the use of a licensed pesticide applicator required (use of restricted use pesticides)?

3.8 Toxic Substances Control Act (TSCA) see also OSHA requirements

Much of TSCA deals with the manufacture, use and distribution of chemicals in commerce with limited impact to WESTON. There are, however, management requirements (to include remediation and disposal efforts) for specific chemicals (most importantly lead-based paint, PCBs, and asbestos).

Note: A "Yes" will require an appropriate technical approach to address the toxic material and must be included within the project-specific HASP. A "No" will require appropriate documentation from the Client or their designee describing how this determination was reached. An "Unknown" will require follow-up and receipt of documentation prior to proceeding.

WESTON may conduct its own survey and analysis to resolve "No" and "Unknown" responses if necessary.

Yes	No	Unknown	Criteria for Evaluation
Lead-Based Paint (40 CFR 745)			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Has the site been evaluated for the presence of lead or lead-containing materials?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve the removal of lead-contaminated materials?
Polychlorinated Biphenyls (PCBs) (40 CFR 761)			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Has the site been evaluated for the presence of PCBs or PCB-contamination?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve the removal or handling of PCBs?
Asbestos (40 CFR 762)			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Does the site or structures contain asbestos containing material (ACM)?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve the disruption or removal of ACM?

3.9 Natural Resources and the Endangered Species Act

The Endangered Species Act (ESA) was passed to designate and protect fish, wildlife and plant species that are endangered or threatened as well as designate critical habitat for those species. Compliance with the ESA is required within the context of this checklist for not only necessary permits (e.g., Stormwater), but, as a means of understanding the potential environmental impact of our work efforts.

Yes	No	Unknown	Criteria for Evaluation
General			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is the project site in an area identified as habitat for endangered, threatened or special interest species?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project result in a change in the diversity or numbers of any species of plants or animals?

Yes	No	Unknown	Criteria for Evaluation
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project result in the reduction of numbers or habitat damage to any unique, rare, threatened or endangered species of plants or animals?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project result in the introduction of new species of plant or animal (including microbes, etc.)?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project result in any barrier(s) to the migration or movement of animals?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project result in any significant alteration, deterioration, or destruction of habitat?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project result in the alteration, destruction, or significant impact to any environmentally sensitive areas (e.g., wetlands, floodplains, critical habitat, prime farm land, coastal zones, etc.)?

Note that a location-specific understanding of the ESA is necessary for completion of applications relating to air quality permitting, stormwater permitting and potentially others.

3.10 National Environmental Policy Act

The purpose of the National Environmental Policy Act (NEPA) is to encourage harmony between man and the environment, promote efforts to prevent or eliminate damage and stimulate the health and welfare of man, and to enrich the understanding of the ecological systems and natural resources that are important to the Nation. In context, NEPA requires federal agencies to prepare an environmental impact statement covering proposed actions that could significantly affect the quality of the human environment.

Yes	No	Unknown	Criteria for Evaluation
General			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is the project a major Federal action, or project, or a project requiring a federal permit, receiving federal funds, or located on federal land? (NEPA)

3.11 Noise (see also OSHA requirements)

The Noise Control Act promotes the policy that the environment is to be free of noise that jeopardizes health or welfare. While there are limited Federal/EPA regulations, there are State and Local regulations/ordinances that are applicable to work tasks.

Yes	No	Unknown	Criteria for Evaluation
General			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project cause an increase in noise levels?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is the project site near sensitive receptor populations (e.g., residences, hospitals, schools, etc.)?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will site activities extend beyond typical daylight hours?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are there local noise ordinances in effect?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Does the contract (or specifications) identify noise monitoring or other criteria?

3.12 Occupational Safety and Health (specifically 29 CFR 1910 and 1926)

The overall goal of the Occupational Safety and Health Act (OSH Act) is to assure that employees are not adversely affected to hazards that they may be exposed to in the course of employment. All work activities conducted by WESTON must comply with applicable components of the General Industry Standards, the Construction Standards, or the applicable requirements of Client-specific criteria (e.g., the Corps of Engineers).

Yes	No	Unknown	Criteria for Evaluation
General			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will project activities be conducted under OSHA Construction Standards?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will project activities be conducted under OSHA General Industry Standards?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will project activities be conducted under the requirements of EM 385-1-1 (USACE)?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Does the client have any specific occupational/safety requirements for the site work?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will project activities be conducted under other standards?

Based upon site activities, location and tasks follow all applicable criteria outline in WESTON's Safety and Health requirements guidelines.

3.13 Transportation (specifically 49 CFR Parts 171-179, 383, 390-399)

Transportation in the context of this checklist typically relates to the transportation of hazardous chemicals. The Department of Transportation (DOT) has specific regulatory requirements that must be met if WESTON either conducts or oversees the preparation for transport or actual transportation of hazardous chemicals/materials designated by DOT.

Note: *Security Plans are required for transporting hazardous materials in an amount that must be placarded, hazardous materials in a bulk packaging having a capacity equal to or greater than 3,500 gallons for liquids or gases or more than 468 cubic feet for solids, or a select agent or toxin regulated by the Centers for Disease Control and Prevention under 42 CFR Part 73. Contact your local Dangerous Goods Advisor for assistance.*

Yes	No	Unknown	Criteria for Evaluation
General			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will site activities involve the transportation (or storage incidental to transportation) of hazardous materials?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will WESTON personnel be transporting hazardous materials (in any amount)?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will WESTON personnel be operating vehicles meeting the definition of a commercial vehicle?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will WESTON personnel be operating vehicles transporting a hazardous material in a placarded amount?

3.14 Radiation

Various regulations under the auspices of the Nuclear Regulatory Agency (10 CFR) require specific procedures for the handling, training, storage and maintenance of nuclear materials.

Yes	No	Unknown	Criteria for Evaluation
General			
<i>(For the following questions indicate whether these tasks are by WESTON, Subcontractor, Client or Vendor.)</i>			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will Radiation sources be used or present?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve the transportation of radioactive material?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve the storage of radioactive material?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve the disposal of radioactive material?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve the use or storage of a radioactive source (e.g., troxler gauge, XRF)?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Have users been properly trained and certified?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are users operating under a radiation monitoring program?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Have rad licenses been transferred and/or the client notified of the presence of rad sources?

Based upon site activities, location and tasks follow all applicable criteria outlined in WESTON's EHS Program.

3.15 Historic/Archaeological

There are numerous Federal, State, Local and Tribal requirements outlining procedures to protect historic and cultural properties. These include those that exist as well as those that are discovered during work activities.

Yes	No	Unknown	Criteria for Evaluation
General			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is the site or project in an area that is of historic or archeological interest?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project result in alteration or destruction of an archeological or historical site, structure, object or building that is on or eligible for inclusion in the National Register of Historic Places?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve the excavation, altering, defacing, or removal of archaeological objects or resources or Native Indian graves, cairns, or glyptic records?

Note that a location-specific understanding of historic and archaeological issues is necessary for completion of applications relating to air quality permitting, stormwater permitting and potentially others.

3.16 Miscellaneous

The following items are included based upon information that must be evaluated for certain WESTON work criteria, for certain sites e.g., real-estate transactions, military locations and for specific hazards.

Yes	No	Unknown	Criteria for Evaluation
General			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Have subcontractors been screened by Procurement and an EHS Manager or Safety Officer?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Has a Client Services Manager (CSM), Project Manager (PM), or WESTON Officer engaged WESTON's Subcontractors using the Subcontractor Talking points?

Yes	No	Unknown	Criteria for Evaluation
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Has a project Kick-off meeting been planned?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will a Safety Officer or an EHS Manager be involved in the kick-off meeting?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the average work day including driving to and from the site exceed 12 hours? If yes, there must be a plan for addressing driving safety and fatigue.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will project personnel be driving vehicles they are not familiar with? If yes, there must be a plan for addressing driving safety.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will there be work at elevation (greater than 4 foot difference in elevations between working levels, work from ladders, work from scaffolding, use of aerial lifts, floor openings, wall openings)?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will there be potential for struck by hazards (moving equipment, thrown or falling objects or material)?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will there be potential for being caught in (conveyors, power-take-off, screens, etc.) or between moving machinery?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will there be work with or within 10 feet of exposed electrical conductors?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are there overhead utilities?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are there underground utilities?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project add additional traffic volume or types (material or equipment haul trucks) that may require community approval or plans?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will there be a traffic control plan for off-site and on-site vehicles?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is the facility a military facility?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Has the potential for UXO/MEC encounter been objectively evaluated?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will there be slip, trip and fall hazards
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will there be repetitive and or heavy lifting?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If demolition work has the demolition plan, engineering survey and required components been addressed?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are there OSHA Specific Standards applicable (asbestos, lead, cadmium, arsenic, hexavalent chromium, benzene, vinyl chloride, methylene chloride, butadiene, formaldehyde, dibromochloropropane)?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will work be performed over or near water or boats?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will boats be used?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will Lifting Equipment and rigging be used?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is there a communication Plan for letting neighbors know of WESTON activities that may impact them?

3.17 Real Estate and Tenant Issues

WESTON as an owner or operator assumes liability for actions or activities conducted by ourselves or by others (tenants). We must ensure compliance with Federal, State and Local requirements. The following outline major issues, however, as indicated previously for the EHS Checklist, it is not meant to be comprehensive. Remember, if we have tenants occupying portions of facilities that are under our control, we have an obligation to understand and assure compliance. For the following issues compliance may be by WESTON, by various tenants or a combination, ensure that each tenant is evaluated. Note that various components of the previous EHS Checklist sections may be appropriate.

Yes	No	Unknown	Criteria for Evaluation
Air			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are boilers or other pressure vessels (e.g., chillers, air receivers) located within our work space or at tenant locations?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Have they been certified and inspected?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Do emission sources (e.g., boilers, chillers, bulk oil storage, etc.) have proper registration (federal, state or local)?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are tenants responsible for compliance with inspections and permits?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is WESTON responsible for inspections and permits?
Occupancy and Other Permits			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Do Business Permits/Certificate of Occupancy Requirements: State, County, City/Municipality need to be addressed? If yes, is WESTON responsible? ____ and/or are tenants responsible? ____
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are Fire Code Inspections (e.g., materials storage, electrical, suppression systems) due? Are Corrective Actions due from past inspections? ____ If yes, is WESTON responsible? ____ and/or are tenants responsible? ____
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are local permits and/or registrations for USTs or ASTs available or needed?
RCRA			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is the facility a Hazardous Waste Generator? If yes, what size? ____ Is WESTON responsible? ____ What is the waste stream? _____
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Do tenants generate Hazardous Wastes? If yes, what quantity? ____ What is the waste stream? _____
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are appropriate permits available for waste generation?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is facility and/or are tenants under litigation or regulatory action for non-compliance with RCRA?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are USTs or ASTs on site? If yes, what are type, size, contents _____
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Have USTs been upgraded for overflow and spill control protection?
Water and Stormwater			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is a stormwater permit and plan necessary for the site?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is a NPDES and/or local discharge permit necessary for the site?
EPCRA			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Do any of the chemicals used or stored on site meet the definition of a hazardous substance and meet or exceed the threshold planning quantity (TPQ) for that chemical or 500 pounds, whichever is lower? (See 40 CFR Part 355 Appendix A and B). <i>If inventory meets criteria (material and quantity) then reports to LEPC, local Fire Department and SERC required. (See 40 CFR 370.21).</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is WESTON responsible for compliance?

Yes	No	Unknown	Criteria for Evaluation
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are Tenants responsible for compliance?
SPCC and Oil			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will oil or petroleum products be stored at the site/operation?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the storage capacity of oil or petroleum products exceed 1320 gallons in above ground storage (include only containers equal to or larger than 55 gallons), or 42000 gallons underground?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is WESTON responsible for compliance?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are Tenants responsible for compliance?
Compliance			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is the site under enforcement action for regulatory non-compliance?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is any Tenant under enforcement action for regulatory non-compliance?

3.18 Explosives

Various regulations under the auspices of the Bureau of Alcohol, Tobacco, Firearms and Explosives (BATFE), 27 CFR Part 55 – Commerce in Explosives and 27 CFR Part 55 the Safe Explosives Act, require specific procedures for the purchase, use, storage, handling and sale of explosives or explosive containing items. Attention to these questions will help to manage our risk when developing projects that may involve explosives or munitions.

Yes	No	Unknown	Criteria for Evaluation
General			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve the handling or use of explosives or munitions that are either new or recovered (e.g. dynamite, military munitions, UXO, detonating cord, TNT, etc.)?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve the storage of explosives?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project involve the transportation of explosives?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Have project personnel been cleared by BATFE as either a Possessor or Responsible Party to handle explosives?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will the project require a State Licensed Blaster?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Will WESTON's Explosives Users Permit be required to execute the project? If yes, has the UXO Service Line Manager been notified?

3.19 Sustainability

There are a wide range of options for integrating sustainability into the execution of projects, far beyond what can be incorporated into this checklist. The following are a few broad questions which are designed to stimulate thinking about how sustainable approaches could be utilized throughout project execution. A checklist of credits used in evaluating projects for LEED (Leadership in Energy and Environmental Design) could be used here in addition to the checklist below. Inclusion of an employee who is LEED AP Certified in the development of the work plan could help add other considerations, such as sustainable sites and efficient materials and resources. See the WESTON Sustainability Portal <http://westonportal/sites/sustainability/default.aspx> for further details.

Yes	No	Unknown	Criteria for Evaluation
General			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are there opportunities to reduce travel-related energy and environmental impacts associated with the project through such techniques as carpooling, use of videoconferencing, telecommuting or utilization of local personnel?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Has consideration been given to the potential for beneficial reuse or recycling of materials that will be excavated, removed or discarded during project execution?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are there opportunities to utilize alternative or renewable energy on the project, through applications such as photovoltaics (solar) or wind power for remote sensing and/or trailer power, or alternative fuel (e.g. biodiesel) for fleet vehicles or equipment?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Have "green" considerations been integrated into the procurement process for materials and or equipment (e.g. recycled content, energy efficiency, recyclability, minimal packaging)?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are there opportunities to increase energy or water efficiency in the execution of the project through selection of appropriate equipment or technical approaches?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are there opportunities to offset some of the environmental impacts of the project through purchase of carbon credits, renewable energy credits or wetlands banking?
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Could a Community Partnering/Make-a-Difference event be coordinated or integrated with this project?